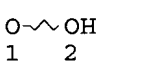
```
=> d que l49
L22       397488 SEA FILE=REGISTRY ABB=ON  PLU=ON  CR/ELS
L23        66611 SEA FILE=REGISTRY ABB=ON  PLU=ON  L22 AND RSD/FA
L24        68179 SEA FILE=REGISTRY ABB=ON  PLU=ON  L22 AND NC=1
L25        89830 SEA FILE=REGISTRY ABB=ON  PLU=ON  L23 OR L24
L26        27108 SEA FILE=REGISTRY ABB=ON  PLU=ON  L22 AND NC=2
L27        99634 SEA FILE=REGISTRY ABB=ON  PLU=ON  L25 OR L26
L28       297854 SEA FILE=REGISTRY ABB=ON  PLU=ON  L22 NOT L27
L29        17967 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L27(L)CAT/RL
L30         1936 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L28(L)CAT/RL
L31        19464 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L29 OR L30
L32         7680 SEA FILE=HCAPLUS ABB=ON   PLU=ON  EPOXIDATION+PFT/CT
L33         5385 SEA FILE=HCAPLUS ABB=ON   PLU=ON  EPOXIDATION CATALYSTS+PFT/CT
L34        10511 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L32 OR L33
L35          169 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L31 AND L34
L36       188224 SEA FILE=REGISTRY ABB=ON  PLU=ON  OC2/ES
L37        78784 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L36(L)PREP/RL
L38           94 SEA FILE=HCAPLUS ABB=ON   PLU=ON  L35 AND L37
L39              TRANSFER  PLU=ON  L38 1- RN :    2073 TERMS
L40         2073 SEA FILE=REGISTRY ABB=ON  PLU=ON  L39
L41              STR
```

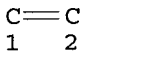


```
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   2

STEREO ATTRIBUTES: NONE
L42           12 SEA FILE=REGISTRY SUB=L40 SSS FUL L41
L43        25729 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42(L)(RACT OR RCT OR RGT)/RL

L44           26 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L43 AND L38
L45              STR
```



```
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   2

STEREO ATTRIBUTES: NONE
L47          246 SEA FILE=REGISTRY SUB=L40 SSS FUL L45
L48       138601 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L47(L)(RACT OR RGT OR RCT)/RL

L49           26 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L48 AND L44
```

=> d l49 ibib abs hitind hitstr 1-26

L49 ANSWER 1 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:189061 HCAPLUS
DOCUMENT NUMBER: 141:73263
TITLE: Biphasic selective epoxidation of styrene by t-butyl hydroperoxide to styrene oxide using potassium chromate or dichromate catalyst in aqueous medium
AUTHOR(S): Choudhary, Vasant. R.; Patil, Nilesh S.; Chaudhari, Nitin K.; Bhargava, Suresh K.
CORPORATE SOURCE: Chemical Engineering and Process development Division, National Chemical Laboratory, Pune, 411008, India
SOURCE: Catalysis Communications (2004), 5(4), 205-208
CODEN: CCAOAC; ISSN: 1566-7367
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 141:73263

AB Styrene oxide with high selectivity (>60%) at high conversion (>50%) was produced by biphasic epoxidn. of styrene by t-Bu hydroperoxide, using potassium chromate or potassium dichromate as catalyst in the presence of water. The reactants and products exist in the non-aqueous (organic) phase, while the catalyst exists in the aqueous phase, and is easily recovered. Both potassium chromate and potassium dichromate catalysts show high activity in the biphasic epoxidn., however, the preferable catalyst is potassium chromate.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

IT **Epoxidation catalysts**
(aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)

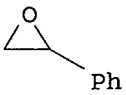
IT **96-09-3P**, Styrene oxide
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)

IT **75-91-2**, tert-Butyl hydroperoxide **100-42-5**, Styrene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)

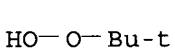
IT **7778-50-9**, Potassium dichromate **7789-00-6**, Potassium chromate
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. catalyst; aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)

IT **96-09-3P**, Styrene oxide
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)

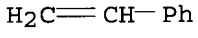
RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)



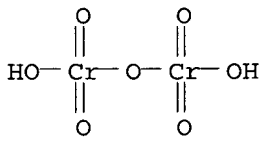
IT **75-91-2**, tert-Butyl hydroperoxide **100-42-5**, Styrene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)



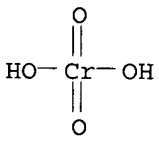
RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)



IT **7778-50-9**, Potassium dichromate **7789-00-6**, Potassium chromate
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. catalyst; aqueous biphasic selective epoxidn. of styrene by t-Bu hydroperoxide to styrene oxide using potassium chromate or potassium dichromate recoverable catalyst)
RN 7778-50-9 HCAPLUS
CN Chromic acid (H2Cr2O7), dipotassium salt (9CI) (CA INDEX NAME)



RN 7789-00-6 HCAPLUS
CN Chromic acid (H2CrO4), dipotassium salt (8CI, 9CI) (CA INDEX NAME)



●2 K

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 2 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:74312 HCAPLUS
DOCUMENT NUMBER: 140:341068
TITLE: Epoxidation of octene-1 and ethylallyl ethylacrylate by tert-butyl hydroperoxide in the presence of metal borides
AUTHOR(S): Trach, Yu. B.; Makota, O. I.; Nikipanchuk, M. V.; Pyrig, I. Yu.; Makitra, R. G.
CORPORATE SOURCE: Nats. Univ. "L'vovskaya Politekhnika", Lvov, Ukraine
SOURCE: Neftekhimiya (2003), 43(6), 464-467
CODEN: NEFTAH; ISSN: 0028-2421
PUBLISHER: Nauka
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB Epoxidn. of 1-octene and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides in chlorobenzene and toluene was studied. Mo and V borides exhibit highest activity. Epoxidn. proceeds via formation of a catalyst-olefin complex.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

IT **Epoxidation**
Epoxidation catalysts
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)

IT **12007-16-8**, Chromium diboride 12007-23-7, Hafnium diboride 12007-27-1, Molybdenum diboride 12007-29-3, Niobium diboride 12007-35-1, Tantalum diboride 12007-37-3, Vanadium diboride 12007-97-5, Molybdenum boride (Mo2B5) 12007-98-6, Tungsten boride (W2B5) 12045-63-5, Titanium diboride 12045-64-6, Zirconium diboride
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)

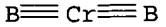
IT **2984-50-1P**, 1-Octene epoxide
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)

IT **75-91-2 111-66-0**, 1-Octene **93549-68-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)

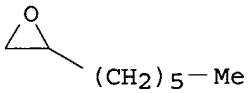
IT **12007-16-8**, Chromium diboride
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)

RN 12007-16-8 HCAPLUS

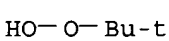
CN Chromium boride (CrB2) (8CI, 9CI) (CA INDEX NAME)



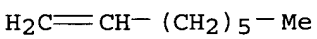
IT **2984-50-1P**, 1-Octene epoxide
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)
RN 2984-50-1 HCAPLUS
CN Oxirane, hexyl- (9CI) (CA INDEX NAME)



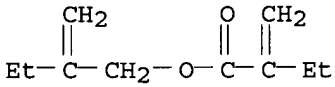
IT **75-91-2 111-66-0**, 1-Octene **93549-68-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of octene-1 and ethylallyl ethylacrylate by tert-Bu hydroperoxide in the presence of metal borides)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)



RN 93549-68-9 HCAPLUS
CN Butanoic acid, 2-methylene-, 2-methylenebutyl ester (9CI) (CA INDEX NAME)



L49 ANSWER 3 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:747904 HCAPLUS
DOCUMENT NUMBER: 139:278233
TITLE: Process for epoxidation of organic compounds with oxygen or oxygen-delivering compounds using catalysts containing metal-organic framework (MOF) materials
INVENTOR(S): Mueller, Ulrich; Lobree, Lisa; Hesse, Michael; Yaghi,

Omar M.; Eddaoudi, Mohamed
PATENT ASSIGNEE(S): BASF Aktiengesellschaft, Germany; The Regents of the University of Michigan
SOURCE: U.S., 13 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6624318	B1	20030923	US 2002-157494	20020530
WO 2003101975	A1	20031211	WO 2003-EP5547	20030527
W: US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
EP 1513823	A1	20050316	EP 2003-730125	20030527
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				

PRIORITY APPLN. INFO.: US 2002-157494 A 20020530
WO 2003-EP5547 W 20030527

OTHER SOURCE(S): CASREACT 139:278233

AB The present invention relates to a process for the epoxidn. of ≥1 organic compound with an oxygen-delivering substance, for example a hydroperoxide, in the presence of ≥1 catalyst containing a metal-organic framework material comprising pores and a metal ion and ≥1 bidentate organic compound, said bidentate organic compound being coordinately bound to the metal ion. Thus, a 66:24:10 volume ratio of O2, He, and propylene was streamed through a tube reactor containing AgNO3-treated MOF-5 at 220° to give propylene oxide with a turnover of 3.3% and selectivity of 10.3% ofter 15 h.

IC ICM C07D301-04
ICS C07D301-12; C07D301-19
INCL 549529000; 549523000; 549531000; 549533000; 549534000; 549536000
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 27, 30, 32, 67

IT **Epoxidation**
Epoxidation catalysts
Pore size
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

IT **115-07-1D**, 1-Propene, 3-halo derivs.
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(allyl halides; epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

IT 7761-88-8, Silver nitrate, uses 13775-47-8 14127-61-8, Calcium 2+, uses 14175-55-4, Silicon 2+, uses 14280-50-3, Lead 2+, uses 14302-87-5, Mercury +2, uses 14546-48-6, Manganese 3+, uses 14627-67-9, Thallium 3+, uses 14701-21-4, Silver +1, uses 14701-22-5, Nickel +2, uses 14903-34-5, Nickel +1, uses 15121-26-3, Vanadium 2+, uses 15158-11-9, Copper +2, uses 15158-12-0, Lead 4+, uses 15438-31-0, Iron 2+, uses 15543-40-5, Zirconium 4+, uses 15735-13-4, Germanium 2+, uses 16043-45-1, Titanium 4+, uses **16065-83-1**, Chromium 3+, uses 16065-84-2, Germanium 4+, uses 16065-88-6, Palladium +2, uses 16130-78-2, Zinc terephthalate 16397-91-4, Manganese 2+, uses

16463-30-2, Bismuth +1, uses 17428-41-0, Arsenic +5, uses 17493-86-6, Copper +1, uses 20074-52-6, Iron 3+, uses 20561-55-1, Palladium +1, uses 20561-56-2, Platinum +1, uses 20561-59-5, Rhodium 1+, uses 20681-14-5, Gold +1, uses 22537-22-0, Magnesium 2+, uses 22537-23-1, Aluminum 3+, uses 22537-24-2, Silicon 4+, uses 22537-29-7, Scandium 3+, uses 22537-33-3, Gallium 3+, uses 22537-39-9, Strontium 2+, uses 22537-40-2, Yttrium 3+, uses 22537-48-0, Cadmium +2, uses 22537-49-1, Indium 3+, uses 22537-50-4, Tin 4+, uses 22537-51-5, Antimony +5, uses 22541-12-4, Barium 2+, uses 22541-25-9, Hafnium 4+, uses 22541-33-9, Bismuth +5, uses 22541-53-3, Cobalt 2+, uses 22541-54-4, uses 22541-59-9, Ruthenium 2+, uses 22541-60-2, Rhodium 2+, uses 22541-63-5, Cobalt 3+, uses 22541-76-0, Vanadium 4+, uses 22541-77-1, Vanadium 3+, uses 22541-83-9, Niobium 3+, uses 22541-86-2, Molybdenum 3+, uses 22541-88-4, Ruthenium 3+, uses 22541-90-8, Tin 2+, uses 22541-99-7, Tungsten 3+, uses 22542-03-6, Rhenium 2+, uses 22542-06-9, Osmium 3+, uses 22542-07-0, Osmium 2+, uses 22542-09-2, Iridium 2+, uses 22542-10-5, Platinum +2, uses 22679-96-5, Antimony +1, uses 22856-08-2, Arsenic +1, uses 23713-46-4, Bismuth +3, uses 23713-48-6, Antimony +3, uses 23713-49-7, Zinc +2, uses 29010-86-4D, Benzenedicarboxylic acid, ester 35182-18-4, Tantalum 3+, uses 36756-53-3, Rhenium 3+, uses 54923-08-9, Iridium 1+, uses 255367-67-0
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

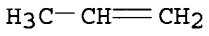
IT 57-10-3, Palmitic acid, reactions **60-33-3**, Linoleic acid, reactions **68-26-8**, Vitamin a **74-85-1**, Ethene, reactions **75-38-7**, Vinylidene fluoride 77-73-6, Dicyclopentadiene **78-70-6**, Linalool **78-79-5**, Isoprene, reactions **79-10-7**, Acrylic acid, reactions **79-41-4**, Methacrylic acid, reactions 95-13-6, Indene **97-54-1**, Isoeugenol **98-83-9**, Methylstyrene, reactions **100-40-3**, Vinylcyclohexene **100-42-5**, Styrene, reactions **104-46-1**, Anethole **106-24-1**, Geraniol **106-98-9**, 1-Butene, reactions **106-99-0**, Butadiene, reactions **107-01-7**, 2-Butene **107-18-6**, Allyl alcohol, reactions **109-92-2**, Ethoxyethene **110-16-7**, Maleic acid, reactions 110-83-8, Cyclohexene, reactions **112-80-1**, Oleic acid, reactions **115-07-1**, Propylene, reactions **115-11-7**, Isobutene, reactions **115-95-7**, Linalyl acetate 142-29-0, Cyclopentene 498-66-8, Norbornene **504-60-9**, Piperylene **513-42-8**, Methallyl alcohol **563-47-3**, Methallyl chloride **588-59-0**, Stilbene **591-97-9**, Crotyl chloride **625-38-7**, Vinylacetic acid 628-92-2, Cycloheptene **695-12-5**, Vinylcyclohexane **930-22-3**, Vinyloxirane 931-88-4, Cyclooctene **1321-74-0**, Divinylbenzene, reactions 1501-82-2, Cyclododecene **3724-65-0**, Crotonic acid 6142-73-0, Methylenecyclopropane **6842-15-5**, Tetrapropylene **7235-40-7**, β-Carotene **9003-17-2**, Polybutadiene **9003-27-4**, Polyisobutene 11069-19-5, Dichlorobutene 11098-57-0, Pentenol 12542-32-4, Butenediol **13987-01-4**, Tripropylene 25167-70-8, Diisobutene 25264-93-1, Hexene 25339-56-4, Heptene 25377-72-4, Pentene 25377-82-6, Tridecene 25377-83-7, Octene 25378-22-7, Dodecene **25737-30-8**, Diphenylbutadiene 26952-13-6, Tetradecene 27070-59-3, Cyclododecatriene 27215-95-8, Nonene 27400-78-8, Eicosene 29965-97-7, Cyclooctadiene 39014-56-7, Tetrahydroindene

40356-67-0, Vinylnorbornene 42296-74-2, Hexadiene 57323-59-8, Butenol 61665-19-8, Trimethylpentene 64391-40-8, 2-Tridecenol 73456-83-4, Octadienol 224802-37-3, Cyclopentenediol
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

IT **80-15-9**, Cumen hydroperoxide **3071-32-7**, Ethylbenzene hydroperoxide **7722-84-1**, Hydrogen peroxide, reactions 7782-44-7, Oxygen, reactions 10028-15-6, Ozone, reactions 10102-43-9, Nitric oxide, reactions
RL: **RGT (Reagent)**; **RACT (Reactant or reagent)**
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

IT **115-07-1D**, 1-Propene, 3-halo derivs.
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(allyl halides; epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)

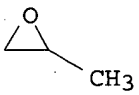


IT **16065-83-1**, Chromium 3+, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

RN 16065-83-1 HCAPLUS
CN Chromium, ion (Cr3+) (8CI, 9CI) (CA INDEX NAME)

IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)

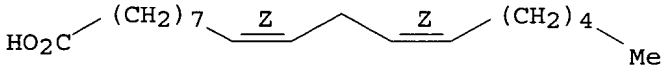


IT **60-33-3**, Linoleic acid, reactions **68-26-8**, Vitamin a **74-85-1**, Ethene, reactions **75-38-7**, Vinylidene fluoride **78-70-6**, Linalool **78-79-5**, Isoprene, reactions **79-10-7**, Acrylic acid, reactions **79-41-4**, Methacrylic acid, reactions **97-54-1**, Isoeugenol **98-83-9**, Methylstyrene, reactions **100-40-3**, Vinylcyclohexene

100-42-5, Styrene, reactions **104-46-1**, Anethole
106-24-1, Geraniol **106-98-9**, 1-Butene, reactions
106-99-0, Butadiene, reactions **107-01-7**, 2-Butene
107-18-6, Allyl alcohol, reactions **109-92-2**,
Ethoxyethene **110-16-7**, Maleic acid, reactions **112-80-1**
, Oleic acid, reactions **115-07-1**, Propylene, reactions
115-11-7, Isobutene, reactions **115-95-7**, Linalyl acetate
504-60-9, Piperylene **513-42-8**, Methallyl alcohol
563-47-3, Methallyl chloride **588-59-0**, Stilbene
591-97-9, Crotyl chloride **625-38-7**, Vinylacetic acid
695-12-5, Vinylcyclohexane **930-22-3**, Vinyloxirane
1321-74-0, Divinylbenzene, reactions **3724-65-0**, Crotonic
acid **6842-15-5**, Tetrapropylene **7235-40-7**,
β-Carotene **9003-17-2**, Polybutadiene **9003-27-4**,
Polyisobutene **13987-01-4**, Tripropylene **25737-30-8**,
Diphenylbutadiene **40356-67-0**, Vinylnorbornene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

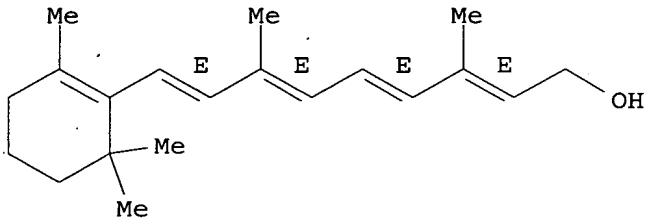
RN 60-33-3 HCAPLUS
CN 9,12-Octadecadienoic acid (9Z,12Z)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

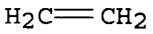


RN 68-26-8 HCAPLUS
CN Retinol (9CI) (CA INDEX NAME)

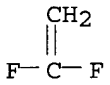
Double bond geometry as shown.



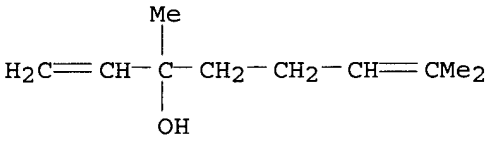
RN 74-85-1 HCAPLUS
CN Ethene (9CI) (CA INDEX NAME)



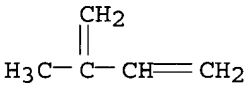
RN 75-38-7 HCAPLUS
CN Ethene, 1,1-difluoro- (9CI) (CA INDEX NAME)



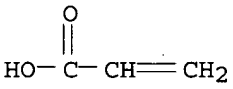
RN 78-70-6 HCAPLUS
CN 1,6-Octadien-3-ol, 3,7-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



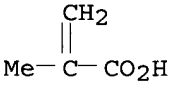
RN 78-79-5 HCAPLUS
CN 1,3-Butadiene, 2-methyl- (9CI) (CA INDEX NAME)



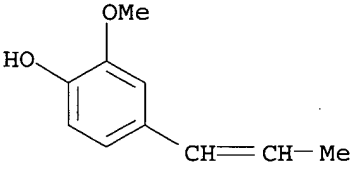
RN 79-10-7 HCAPLUS
CN 2-Propenoic acid (9CI) (CA INDEX NAME)



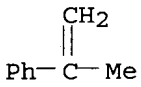
RN 79-41-4 HCAPLUS
CN 2-Propenoic acid, 2-methyl- (9CI) (CA INDEX NAME)



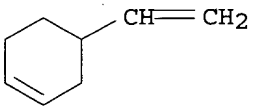
RN 97-54-1 HCAPLUS
CN Phenol, 2-methoxy-4-(1-propenyl)- (9CI) (CA INDEX NAME)



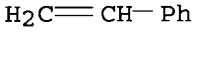
RN 98-83-9 HCAPLUS
CN Benzene, (1-methylethenyl)- (9CI) (CA INDEX NAME)



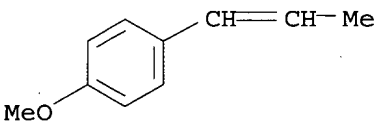
RN 100-40-3 HCAPLUS
CN Cyclohexene, 4-ethenyl- (9CI) (CA INDEX NAME)



RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)

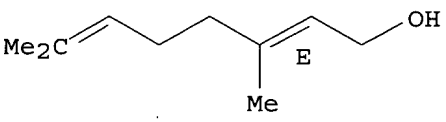


RN 104-46-1 HCAPLUS
CN Benzene, 1-methoxy-4-(1-propenyl)- (9CI) (CA INDEX NAME)

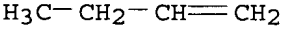


RN 106-24-1 HCAPLUS
CN 2,6-Octadien-1-ol, 3,7-dimethyl-, (2E)- (9CI) (CA INDEX NAME)

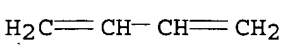
Double bond geometry as shown.



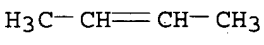
RN 106-98-9 HCAPLUS
CN 1-Butene (8CI, 9CI) (CA INDEX NAME)



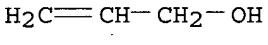
RN 106-99-0 HCAPLUS
CN 1,3-Butadiene (8CI, 9CI) (CA INDEX NAME)



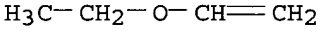
RN 107-01-7 HCAPLUS
CN 2-Butene (8CI, 9CI) (CA INDEX NAME)



RN 107-18-6 HCAPLUS
CN 2-Propen-1-ol (9CI) (CA INDEX NAME)

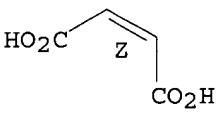


RN 109-92-2 HCAPLUS
CN Ethene, ethoxy- (9CI) (CA INDEX NAME)



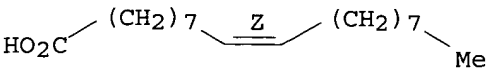
RN 110-16-7 HCAPLUS
CN 2-Butenedioic acid (2Z)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

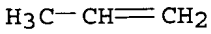


RN 112-80-1 HCAPLUS
CN 9-Octadecenoic acid (9Z)- (9CI) (CA INDEX NAME)

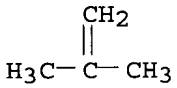
Double bond geometry as shown.



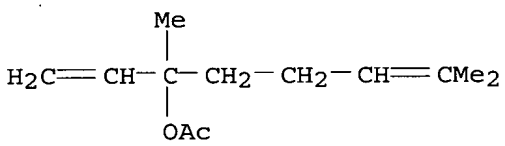
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



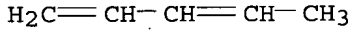
RN 115-11-7 HCAPLUS
CN 1-Propene, 2-methyl- (9CI) (CA INDEX NAME)



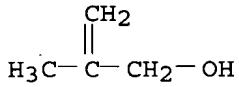
RN 115-95-7 HCAPLUS
CN 1,6-Octadien-3-ol, 3,7-dimethyl-, acetate (8CI, 9CI) (CA INDEX NAME)



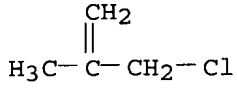
RN 504-60-9 HCAPLUS
CN 1,3-Pentadiene (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 513-42-8 HCAPLUS
CN 2-Propen-1-ol, 2-methyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 563-47-3 HCAPLUS
CN 1-Propene, 3-chloro-2-methyl- (9CI) (CA INDEX NAME)



RN 588-59-0 HCAPLUS
CN Benzene, 1,1'-(1,2-ethenediyl)bis- (9CI) (CA INDEX NAME)

Ph—CH=CH—Ph

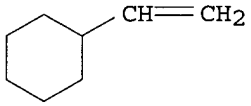
RN 591-97-9 HCAPLUS
CN 2-Butene, 1-chloro- (7CI, 8CI, 9CI) (CA INDEX NAME)

$H_3C—CH=CH—CH_2—Cl$

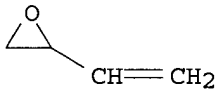
RN 625-38-7 HCAPLUS
CN 3-Butenoic acid (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

$H_2C=CH—CH_2—CO_2H$

RN 695-12-5 HCAPLUS
CN Cyclohexane, ethenyl- (9CI) (CA INDEX NAME)



RN 930-22-3 HCAPLUS
CN Oxirane, ethenyl- (9CI) (CA INDEX NAME)



RN 1321-74-0 HCAPLUS
CN Benzene, diethenyl- (9CI) (CA INDEX NAME)

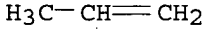
2 [D1—CH=CH$_2$]

RN 3724-65-0 HCAPLUS
CN 2-Butenoic acid (9CI) (CA INDEX NAME)

RN 6842-15-5 HCAPLUS
CN 1-Propene, tetramer (9CI) (CA INDEX NAME)

CM 1

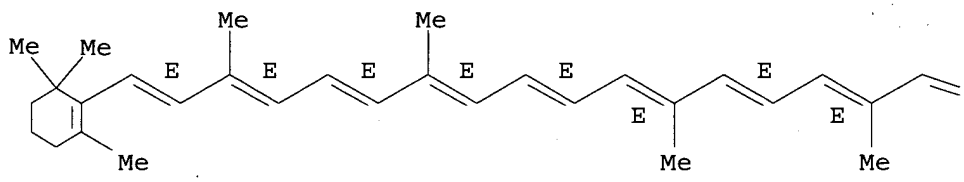
CRN 115-07-1
CMF C3 H6



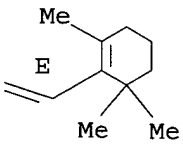
RN 7235-40-7 HCAPLUS
CN β,β-Carotene (9CI) (CA INDEX NAME)

Double bond geometry as shown.

PAGE 1-A



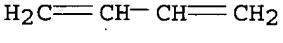
PAGE 1-B



RN 9003-17-2 HCAPLUS
CN 1,3-Butadiene, homopolymer (9CI) (CA INDEX NAME)

CM 1

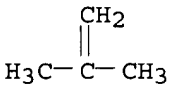
CRN 106-99-0
CMF C4 H6



RN 9003-27-4 HCAPLUS
CN 1-Propene, 2-methyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

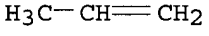
CRN 115-11-7
CMF C4 H8



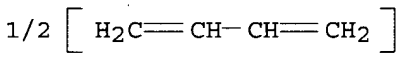
RN 13987-01-4 HCAPLUS
CN 1-Propene, trimer (9CI) (CA INDEX NAME)

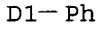
CM 1

CRN 115-07-1
CMF C3 H6

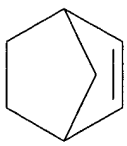


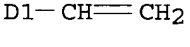
RN 25737-30-8 HCAPLUS
CN 1,3-Butadiene, diphenyl- (7CI, 8CI, 9CI) (CA INDEX NAME)





RN 40356-67-0 HCAPLUS
CN Bicyclo[2.2.1]hept-2-ene, ethenyl- (9CI) (CA INDEX NAME)

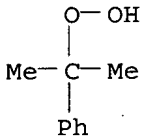




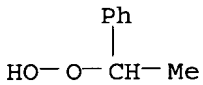
IT **80-15-9**, Cumen hydroperoxide **3071-32-7**, Ethylbenzene hydroperoxide **7722-84-1**, Hydrogen peroxide, reactions

RL: **RGT (Reagent); RACT (Reactant or reagent)**
(epoxidn. of organic compound with oxygen or oxygen-delivering compds. using catalysts containing metal-organic frame-work materials)

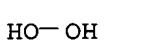
RN 80-15-9 HCAPLUS
CN Hydroperoxide, 1-methyl-1-phenylethyl (9CI) (CA INDEX NAME)



RN 3071-32-7 HCAPLUS
CN Hydroperoxide, 1-phenylethyl (9CI) (CA INDEX NAME)



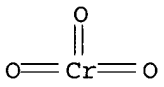
RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)



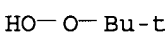
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 4 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:562370 HCAPLUS
DOCUMENT NUMBER: 139:247144
TITLE: Epoxidation of allyl acetate with tert-butyl hydroperoxide catalyzed by MoO3/TiO2
AUTHOR(S): Kanai, Hiroyoshi; Ikeda, Yoshio; Imamura, Seiichiro
CORPORATE SOURCE: Department of Chemistry and Materials Technology, Kyoto Institute of Technology, Sakyo-ku, Kyoto, 606-8585, Japan
SOURCE: Applied Catalysis, A: General (2003), 247(2), 185-191
CODEN: ACAGE4; ISSN: 0926-860X
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 139:247144
AB Selective epoxidn. of allyl acetate with tert-BuOOH over group IV-VI metal oxides supported on SiO2, Al2O3, or TiO2 has been studied. The epoxidn. required higher temps. than α-olefins and cycloolefins did. The poor epoxidn. selectivity was attributed to concurrently occurring reactions of epoxides produced during epoxidn. The highest yield of epoxide was achieved over MoO3/TiO2 with an adequate MoO3 loading which was determined so that the surfaces of TiO2 were two-dimensionally and fully covered with MoO3.

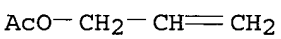
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 27, 67
IT **Epoxidation catalysts**
(for epoxidn. of allyl acetate with hydroperoxide)
IT 1314-23-4, Zirconia, uses 1314-35-8, Tungsten trioxide, uses
1314-62-1, Vanadium pentoxide, uses **1333-82-0**, Chromium trioxide
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. of allyl acetate with hydroperoxide catalyzed by)
IT **75-91-2**, tert-Butyl hydroperoxide **591-87-7**, Allyl
acetate
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of allyl acetate with hydroperoxide catalyzed by MoO3/TiO2)
IT **6387-89-9P**, Glycidyl acetate
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(from epoxidn. of allyl acetate with hydroperoxide catalyzed by MoO3/TiO2)
IT **1333-82-0**, Chromium trioxide
RL: **CAT (Catalyst use)**; USES (Uses)
(epoxidn. of allyl acetate with hydroperoxide catalyzed by)
RN 1333-82-0 HCAPLUS
CN Chromium oxide (CrO3) (8CI, 9CI) (CA INDEX NAME)



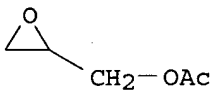
IT **75-91-2**, tert-Butyl hydroperoxide **591-87-7**, Allyl
acetate
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of allyl acetate with hydroperoxide catalyzed by MoO3/TiO2)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 591-87-7 HCAPLUS
CN Acetic acid, 2-propenyl ester (9CI) (CA INDEX NAME)



IT **6387-89-9P**, Glycidyl acetate
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(from epoxidn. of allyl acetate with hydroperoxide catalyzed by MoO3/TiO2)
RN 6387-89-9 HCAPLUS
CN Oxiranemethanol, acetate (9CI) (CA INDEX NAME)



REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 5 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:551504 HCAPLUS
DOCUMENT NUMBER: 139:117802
TITLE: Process for production of propylene oxide
INVENTOR(S): Tsuji, Junpei
PATENT ASSIGNEE(S): Sumitomo Chemical Company, Limited, Japan
SOURCE: PCT Int. Appl., 11 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003057682	A1	20030717	WO 2002-JP13566	20021226
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2003206283	A2	20030722	JP 2002-1164	20020108
EP 1471061	A1	20041027	EP 2002-790879	20021226
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
US 2005085647	A1	20050421	US 2003-500720	20021226
PRIORITY APPLN. INFO.:			JP 2002-1164 A	20020108
			WO 2002-JP13566 W	20021226

AB This document discloses a process for production of propylene oxide which comprises the oxidation step for oxidizing cumene into cumene hydroperoxide, the epoxidn. step of reacting a cumene solution containing cumene hydroperoxide with an excess of propylene in a liquid phase in the presence of a solid catalyst to obtain propylene oxide and cumyl alc., and the hydrogenolysis of the cumyl alc. obtained in the epoxidn. step into cumene through hydrogenolysis in the presence of a solid catalyst and recycling the cumene to the oxidation step as the starting material, wherein the concentration of organic acids in the cumyl alc. fed to the hydrogenolysis step is adjusted to 200 ppm by weight or below.

IC ICM C07D301-19
ICS C07D303-04
CC 35-2 (Chemistry of Synthetic High Polymers)
IT **Epoxidation**
(epoxidn. of propylene)
IT **11099-27-7**

RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst in hydrogenolysis of cumyl alc.)

IT **80-15-9P**, Cumene hydroperoxide 536-60-7P, Cumyl alcohol
RL: IMF (Industrial manufacture); **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(process for production of propylene oxide)

IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(process for production of propylene oxide)

IT **115-07-1**, Propylene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(process for production of propylene oxide)

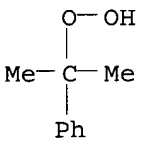
IT **11099-27-7**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst in hydrogenolysis of cumyl alc.)

RN 11099-27-7 HCAPLUS
CN Chromium alloy, nonbase, Cr,Cu (9CI) (CA INDEX NAME)

Component	Component Registry Number
Cr	7440-47-3
Cu	7440-50-8

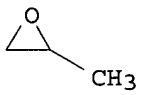
IT **80-15-9P**, Cumene hydroperoxide
RL: IMF (Industrial manufacture); **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(process for production of propylene oxide)

RN 80-15-9 HCAPLUS
CN Hydroperoxide, 1-methyl-1-phenylethyl (9CI) (CA INDEX NAME)



IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(process for production of propylene oxide)

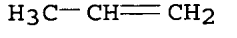
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



IT **115-07-1**, Propylene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(process for production of propylene oxide)

RN 115-07-1 HCAPLUS

CN 1-Propene (9CI) (CA INDEX NAME)



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 6 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:369592 HCAPLUS
DOCUMENT NUMBER: 140:113175
TITLE: New highly efficient catalysts for liquid-phase oxidation
AUTHOR(S): Artemov, A. V.
CORPORATE SOURCE: Mosk. Gos. Univ. Dizaina Tekhnol., Moscow, Russia
SOURCE: Kataliz v Promyshlennosti (2001), (2), 18-23
CODEN: KPARAU
PUBLISHER: ZAO "Kalvis"
DOCUMENT TYPE: Journal
LANGUAGE: Russian

AB Metal nanoparticles having size of 1.0-30 nm and sp. surface ≤ 300 m2/g uniformly dispersed in a liquid were used as catalysts for liquid-phase oxidation, epoxidn. of olefins by peroxides (ex. epoxidn. of propylene and 1-nonene with ethylbenzene hydroperoxide), and hydrogenation of aromatic compds. The metal nanoparticles were prepared in a reactor made as a high-frequency generator with glow discharge between electrodes and metal particles, the nanoparticles being formed in a liquid medium used in the subsequent oxidation processes as a solvent and/or a reactant. The concentration (0.01-5.0 g/L) and size of the metal nanoparticles was found to depend on the production conditions and nature of the metal used. The metal nanoparticles (Ni, Pd, Pt, Co, Fe) were applied on the surface of different inorg. supports, such as silica, aluminum oxide, magnesium oxide and kieselguhr, with the active metal content within 0.01-10%.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

IT **Epoxidation catalysts**
Nanoparticles
Particle size
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

IT **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

IT 108-46-3, 1,3-Benzenediol, reactions **115-07-1**, Propylene, reactions **124-11-8**, 1-Nonene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

IT **79-21-0**, Peracetic acid **80-15-9**, Cumene hydroperoxide **3071-32-7**, Ethylbenzene hydroperoxide **7722-84-1**, Hydrogen peroxide, reactions
RL: **RGT (Reagent)**; **RACT (Reactant or reagent)**
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

IT **75-56-9P**, Propylene oxide, preparation 108-93-0P, Cyclohexanol,

preparation 529-33-9P, 1-Tetralol 529-34-0P, 1-Tetralone
28114-20-7P, 1-Nonene oxide 28553-75-5P, Cyclohexanediol
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

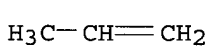
IT **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

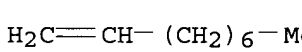
Cr

IT **115-07-1**, Propylene, reactions **124-11-8**, 1-Nonene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)

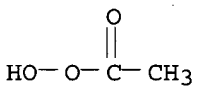


RN 124-11-8 HCAPLUS
CN 1-Nonene (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

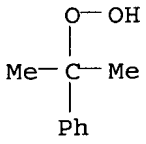


IT **79-21-0**, Peracetic acid **80-15-9**, Cumene hydroperoxide
3071-32-7, Ethylbenzene hydroperoxide **7722-84-1**,
Hydrogen peroxide, reactions
RL: **RGT (Reagent)**; **RACT (Reactant or reagent)**
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)

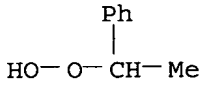
RN 79-21-0 HCAPLUS
CN Ethaneperoxoic acid (9CI) (CA INDEX NAME)



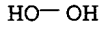
RN 80-15-9 HCAPLUS
CN Hydroperoxide, 1-methyl-1-phenylethyl (9CI) (CA INDEX NAME)



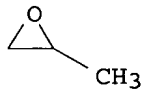
RN 3071-32-7 HCAPLUS
CN Hydroperoxide, 1-phenylethyl (9CI) (CA INDEX NAME)



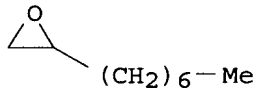
RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)



IT **75-56-9P**, Propylene oxide, preparation **28114-20-7P**, 1-Nonene oxide
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(metal nanoparticles as highly efficient catalysts for liquid-phase oxidation)
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



RN 28114-20-7 HCAPLUS
CN Oxirane, heptyl- (9CI) (CA INDEX NAME)



L49 ANSWER 7 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:58792 HCAPLUS
DOCUMENT NUMBER: 138:108660
TITLE: Mesoporous material and use thereof as catalysts for the selective oxidation of organic compounds
INVENTOR(S): Shan, Zhiping; Maschmeyer, Thomas; Jansen, Jacobus Cornelius

PATENT ASSIGNEE(S): Neth.
SOURCE: U.S. Pat. Appl. Publ., 12 pp., Cont.-in-part of U.S. Pat. Appl. 2002 74,263.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 7
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003017943	A1	20030123	US 2002-246495	20020918
US 6358486	B1	20020319	US 1999-390276	19990907
US 2002074263	A1	20020620	US 2001-995227	20011127
US 6762143	B2	20040713		
WO 2004026473	A1	20040401	WO 2003-US30009	20030917

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:

US 1999-390276	A2	19990907
US 2001-995227	A2	20011127
EP 1998-203134	A	19980917
US 2002-246495	A	20020918

AB A material especially useful for the selective oxidation and related reactions of hydrocarbons and other organic compds. includes a non-crystalline, porous inorg. oxide having at least 97 volume percent mesopores based on micropores and mesopores, and at least one catalytically active metal selected from the group consisting of one or more transition metal and one or more noble metal.

IC ICM B01J023-48
INCL 502243000; 502330000; 502317000; 549523000; 568383000
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
IT Ammoxidation catalysts
Epoxidation catalysts
Hydroxylation catalysts
Oxidation catalysts
(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)
IT 5593-70-4, Titanium (IV) n-butoxide 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-33-7, Tungsten, uses **7440-47-3**, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7761-88-8, Nitric acid silver(1+) salt, uses 16903-35-8, CHLOROAURIC ACID **21679-31-2**, Chromium (III) acetylacetonate
RL: **CAT (Catalyst use)**; USES (Uses)

(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)

IT **75-21-8P**, Ethylene oxide, preparation **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)

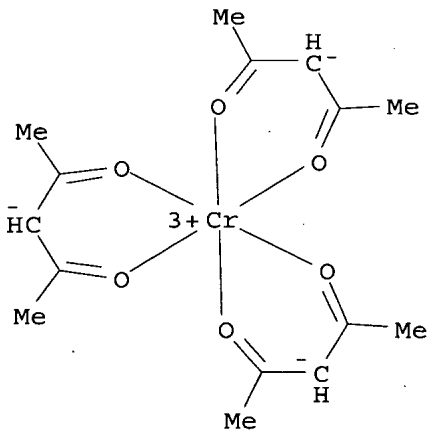
IT 67-64-1, Acetone, reactions **74-85-1**, Ethylene, reactions 74-98-6, Propane, reactions **75-91-2** 78-10-4, Tetraethyl orthosilicate 78-93-3, Methylethyl ketone, reactions 98-86-2, Acetophenone, reactions 106-97-8, Butane, reactions **106-98-9**, 1-Butene, reactions **106-99-0**, Butadiene, reactions **107-01-7**, 2-Butene 108-94-1, Cyclohexanone, reactions 109-66-0, Pentane, reactions 110-82-7, Cyclohexane, reactions 110-83-8, Cyclohexene, reactions **111-66-0**, 1-Octene **115-07-1**, Propylene, reactions **115-11-7**, Isobutylene, reactions 555-31-7, Aluminum isopropoxide 830-13-7, Cyclododecanone 7664-41-7, Ammonia, reactions **7722-84-1**, Hydrogen peroxide, reactions 7782-44-7, Oxygen, reactions 11104-93-1, Nitrogen oxide, reactions 25264-93-1, Hexene 25377-72-4, Pentene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)

IT **7440-47-3**, Chromium, uses **21679-31-2**, Chromium (III) acetylacetonate
RL: **CAT (Catalyst use)**; USES (Uses)
(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)

RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

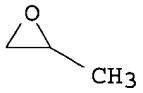
Cr

RN 21679-31-2 HCAPLUS
CN Chromium, tris(2,4-pentanedionato-κO,κO')-, (OC-6-11)- (9CI) (CA INDEX NAME)

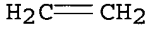


IT **75-21-8P**, Ethylene oxide, preparation **75-56-9P**,
Propylene oxide, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)
RN 75-21-8 HCAPLUS
CN Oxirane (9CI) (CA INDEX NAME)

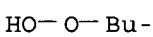
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



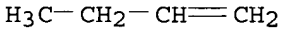
IT **74-85-1**, Ethylene, reactions **75-91-2 106-98-9**,
1-Butene, reactions **106-99-0**, Butadiene, reactions
107-01-7, 2-Butene **111-66-0**, 1-Octene **115-07-1**
, Propylene, reactions **115-11-7**, Isobutylene, reactions
7722-84-1, Hydrogen peroxide, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(mesoporous material and use thereof as catalysts for the selective oxidation of organic compds.)
RN 74-85-1 HCAPLUS
CN Ethene (9CI) (CA INDEX NAME)



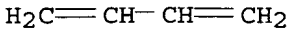
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)



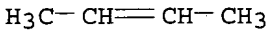
RN 106-98-9 HCAPLUS
CN 1-Butene (8CI, 9CI) (CA INDEX NAME)



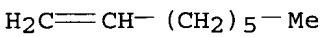
RN 106-99-0 HCAPLUS
CN 1,3-Butadiene (8CI, 9CI) (CA INDEX NAME)



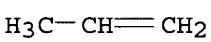
RN 107-01-7 HCAPLUS
CN 2-Butene (8CI, 9CI) (CA INDEX NAME)



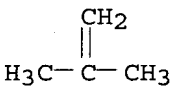
RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)



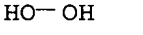
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



RN 115-11-7 HCAPLUS
CN 1-Propene, 2-methyl- (9CI) (CA INDEX NAME)



RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)



L49 ANSWER 8 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:832773 HCAPLUS
DOCUMENT NUMBER: 137:325788
TITLE: Integrated process for the production of olefin oxides
INVENTOR(S): Romano, Ugo; Occhiello, Ernesto; Paludetto, Renato
PATENT ASSIGNEE(S): Polimeri Europa S.p.A., Italy
SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002085875	A1	20021031	WO 2002-EP3299	20020321

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: IT 2001-MI859 A 20010424

AB Integrated process for the production of olefin oxides in which a dehydrogenation unit, a hydrogen peroxide synthesis unit and an epoxidn. unit of C2-C5 olefins are integrated with each other and wherein the hydrogen coming from the dehydrogenation forms a raw material for the preparation of hydrogen peroxide which is fed to the epoxidn. unit together with the olefin produced.

IC ICM C07D301-12

CC 35-2 (Chemistry of Synthetic High Polymers)

IT Dehydrogenation catalysts
Epoxidation catalysts
(integrated process for production of olefin oxides)

IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(integrated process for production of olefin oxides)

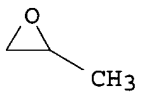
IT **115-07-1P**, Propylene, preparation **7722-84-1P**, Hydrogen peroxide, preparation
RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP (Preparation); **RACT (Reactant or reagent)**
(integrated process for production of olefin oxides)

IT **7440-47-3**, Chromium, uses 7440-55-3, Gallium, uses 7440-62-2, Vanadium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(supported, dehydrogenation catalyst; integrated process for production of olefin oxides)

IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(integrated process for production of olefin oxides)

RN 75-56-9 HCAPLUS

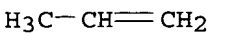
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



IT **115-07-1P**, Propylene, preparation **7722-84-1P**, Hydrogen peroxide, preparation
RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP (Preparation); **RACT (Reactant or reagent)**
(integrated process for production of olefin oxides)

RN 115-07-1 HCAPLUS

CN 1-Propene (9CI) (CA INDEX NAME)



RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)

IT **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(supported, dehydrogenation catalyst; integrated process for production of olefin oxides)
RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 9 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:691656 HCAPLUS
DOCUMENT NUMBER: 137:369906
TITLE: Manganese-Catalyzed Epoxidations of Alkenes in Bicarbonate Solutions
AUTHOR(S): Lane, Benjamin S.; Vogt, Matthew; DeRose, Victoria J.; Burgess, Kevin
CORPORATE SOURCE: Department of Chemistry, Texas A&M University, College Station, TX, 77842-3012, USA
SOURCE: Journal of the American Chemical Society (2002), 124(40), 11946-11954
CODEN: JACSAT; ISSN: 0002-7863
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 137:369906
AB Epoxides were prepared from a variety of alkenes in 51-99% yields by epoxidn. of alkenes in sodium bicarbonate buffer in the presence of manganese (II) sulfate with hydrogen peroxide as the terminal oxidant. A variety of metal catalysts were screened for epoxidn. activity; only manganese salts gave effective yields of epoxides, particularly manganese (II) salts. Many additives were screened; when tert-butanol is used as the cosolvent, sodium acetate is the most effective additive, while when DMF is used as a cosolvent, salicylic acid is the most effective additive. The effectiveness of additive depends on the concentration of additive; at higher concns., the beneficial effects of additives decrease, in some cases decreasing the yields of epoxides. 6 Mol% of sodium acetate and 4 mol% of salicylic acid were found to be the optimal amts. of additives when

tert-butanol and DMF were used, resp., as cosolvents for epoxidn. The additives increased the rates of epoxidn. by 100-200%, gave higher yields with less reactive alkenes, and decreased the amount of hydrogen peroxide necessary for complete reaction. Epoxides were prepared from aryl-substituted, cyclic, and trialkyl-substituted alkenes using 10 equiv of hydrogen peroxide; terminal monosubstituted alkenes such as 1-octene did not react, even in the presence of additives. Peroxymonocarbonate, HCO4-, is formed in the manganese-catalyzed epoxidns. in sodium bicarbonate buffer with either tert-butanol or DMF as cosolvents as detected by 13C NMR; without manganese, minimal epoxidn. activity is observed The yield of epoxide falls as the pH value of the buffer increases, implying that peroxybicarbonate is the oxidant in solution rather than peroxycarbonate. EPR studies show that manganese (II) ions are initially consumed but are regenerated toward the end of the epoxidn., presumably when the hydrogen peroxide is spent. Possible mechanisms for the reaction are discussed. Manganese (II) salts are less toxic and less expensive than other epoxidn. catalysts, do not require ligands, and act as epoxidn. catalysts in nontoxic and inexpensive solvents. The ready isolation of products by neutral extraction both provides product more simply and inexpensively than other methods and allows for simple preparation and isolation of acid-sensitive epoxides which in other methods decomposed under acidic workup conditions.

CC 27-2 (Heterocyclic Compounds (One Hetero Atom))

IT **Epoxidation**
Epoxidation catalysts
(stereoselective; stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

IT **67283-79-8**, Peroxycarbonate
RL: **RGT (Reagent); RACT (Reactant or reagent)**
(detection of peroxybicarbonate as a reactive intermediate in the stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with hydrogen peroxide as the terminal oxidant in the presence of MnSO4)

IT **111-66-0**, 1-Octene
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(failed preparation of 1,2-epoxyoctane by epoxidn. of 1-octene in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

IT **78-70-6**, Linalool 80-56-8, α-Pinene **97-41-6**
98-83-9, α-Methylstyrene, reactions **100-42-5**,
Styrene, reactions **103-30-0**, trans-Stilbene **106-23-0**
110-83-8, Cyclohexene, reactions 447-53-0, 1,2-Dihydronaphthalene
556-82-1, 3-Methyl-2-buten-1-ol **563-79-1**,
2,3-Dimethyl-2-butene **760-21-4**, 3-Methylenepentane 771-98-2,
1-Phenyl-1-cyclohexene 931-87-3, cis-Cyclooctene **1075-49-6**,
4-Vinylbenzoic acid **1914-58-5 4407-36-7**,
trans-Cinnamyl alcohol **7642-15-1**, cis-4-Octene
14850-23-8, trans-4-Octene 56136-14-2
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

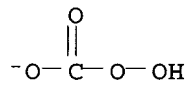
IT **96-09-3P**, Styrene oxide 286-20-4P, Cyclohexene oxide
1192-17-2P, 2,2-Diethyloxirane **1439-07-2P**,
trans-Stilbene oxide **1689-70-9P**, trans-4-Octene oxide

2085-88-3P, α-Methylstyrene oxide 2461-34-9P 4829-01-0P
4925-71-7P, cis-Cyclooctene oxide **5076-20-0P**,
2,2,3,3-Tetramethyloxirane **15249-35-1P 18511-56-3P**
25825-48-3P 27415-21-0P, 4-Octene oxide 32162-27-9P
40641-81-4P 159262-71-2P 167690-92-8P
336823-31-5P **475385-56-9P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

IT 71-48-7, Cobalt (II) acetate 557-34-6, Zinc acetate 3375-31-3,
Palladium (II) acetate 7758-98-7, Copper (II) sulfate, uses 7786-81-4,
Nickel (II) sulfate 10028-22-5, Iron (III) sulfate **10101-53-8**,
Chromium (III) sulfate 13283-01-7, Tungsten hexachloride 15956-28-2,
Dirhodium tetraacetate 27774-13-6, Vanadyl sulfate 70197-13-6,
Methylrhenium trioxide 144026-79-9, Scandium triflate
RL: **CAT (Catalyst use)**; USES (Uses)
(suboptimal metal catalyst for the stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tert-butanol or DMF as cosolvents with hydrogen peroxide as the oxidant)

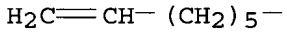
IT **67283-79-8**, Peroxycarbonate
RL: **RGT (Reagent)**; **RACT (Reactant or reagent)**
(detection of peroxybicarbonate as a reactive intermediate in the stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with hydrogen peroxide as the terminal oxidant in the presence of MnSO4)

RN 67283-79-8 HCAPLUS
CN Carbonoperoxoate, monohydrogen (9CI) (CA INDEX NAME)



IT **111-66-0**, 1-Octene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(failed preparation of 1,2-epoxyoctane by epoxidn. of 1-octene in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

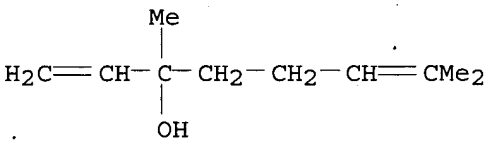
RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)



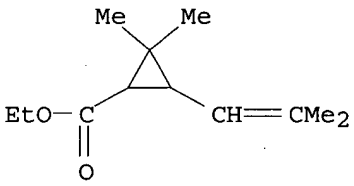
IT **78-70-6**, Linalool **97-41-6 98-83-9**,
α-Methylstyrene, reactions **100-42-5**, Styrene, reactions
103-30-0, trans-Stilbene **106-23-0 556-82-1**,
3-Methyl-2-buten-1-ol **563-79-1**, 2,3-Dimethyl-2-butene
760-21-4, 3-Methylenepentane **1075-49-6**, 4-Vinylbenzoic acid **1914-58-5 4407-36-7**, trans-Cinnamyl alcohol
7642-15-1, cis-4-Octene **14850-23-8**, trans-4-Octene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**

(stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

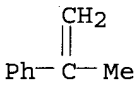
RN 78-70-6 HCAPLUS
CN 1,6-Octadien-3-ol, 3,7-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



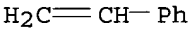
RN 97-41-6 HCAPLUS
CN Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, ethyl ester (9CI) (CA INDEX NAME)



RN 98-83-9 HCAPLUS
CN Benzene, (1-methylethenyl)- (9CI) (CA INDEX NAME)

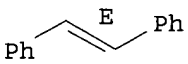


RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)

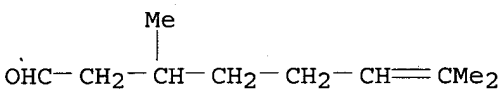


RN 103-30-0 HCAPLUS
CN Benzene, 1,1'-(1E)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

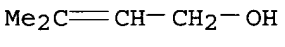
Double bond geometry as shown.



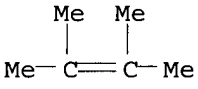
RN 106-23-0 HCAPLUS
CN 6-Octenal, 3,7-dimethyl- (8CI, 9CI) (CA INDEX NAME)



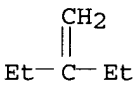
RN 556-82-1 HCAPLUS
CN 2-Buten-1-ol, 3-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



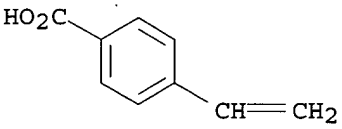
RN 563-79-1 HCAPLUS
CN 2-Butene, 2,3-dimethyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 760-21-4 HCAPLUS
CN Pentane, 3-methylene- (9CI) (CA INDEX NAME)

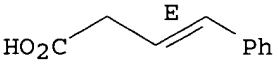


RN 1075-49-6 HCAPLUS
CN Benzoic acid, 4-ethenyl- (9CI) (CA INDEX NAME)



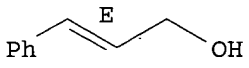
RN 1914-58-5 HCAPLUS
CN 3-Butenoic acid, 4-phenyl-, (3E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



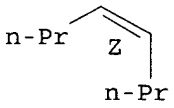
RN 4407-36-7 HCAPLUS
CN 2-Propen-1-ol, 3-phenyl-, (2E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



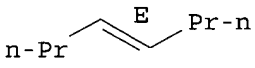
RN 7642-15-1 HCAPLUS
CN 4-Octene, (4Z)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



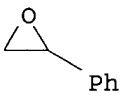
RN 14850-23-8 HCAPLUS
CN 4-Octene, (4E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

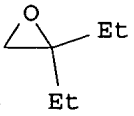


IT **96-09-3P**, Styrene oxide **1192-17-2P**, 2,2-Diethyloxirane **1439-07-2P**, trans-Stilbene oxide **1689-70-9P**, trans-4-Octene oxide **2085-88-3P**, α-Methylstyrene oxide **5076-20-0P**, 2,2,3,3-Tetramethyloxirane **15249-35-1P** **18511-56-3P** **25825-48-3P** **27415-21-0P**, 4-Octene oxide **40641-81-4P** **159262-71-2P** **167690-92-8P** **475385-56-9P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tBuOH or DMF as cosolvents and hydrogen peroxide as the terminal oxidant in the presence of MnSO4 and either sodium acetate or salicylic acid)

RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)

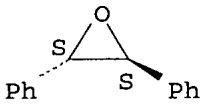


RN 1192-17-2 HCAPLUS
CN Oxirane, 2,2-diethyl- (8CI, 9CI) (CA INDEX NAME)



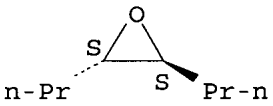
RN 1439-07-2 HCAPLUS
CN Oxirane, 2,3-diphenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.

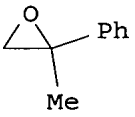


RN 1689-70-9 HCAPLUS
CN Oxirane, 2,3-dipropyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

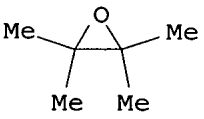
Relative stereochemistry.



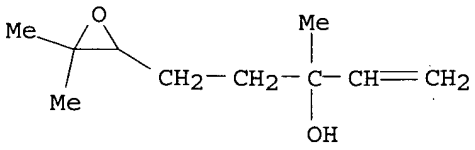
RN 2085-88-3 HCAPLUS
CN Oxirane, 2-methyl-2-phenyl- (9CI) (CA INDEX NAME)



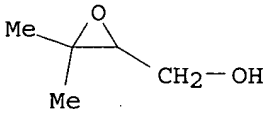
RN 5076-20-0 HCAPLUS
CN Oxirane, tetramethyl- (9CI) (CA INDEX NAME)



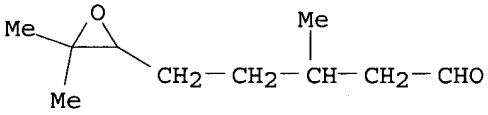
RN 15249-35-1 HCAPLUS
CN Oxiranepropanol, α-ethenyl-α,3,3-trimethyl- (9CI) (CA INDEX NAME)



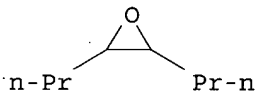
RN 18511-56-3 HCAPLUS
CN Oxiranemethanol, 3,3-dimethyl- (9CI) (CA INDEX NAME)



RN 25825-48-3 HCAPLUS
CN Oxiranepentanal, β,3,3-trimethyl- (9CI) (CA INDEX NAME)

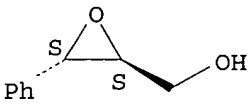


RN 27415-21-0 HCAPLUS
CN Oxirane, 2,3-dipropyl- (9CI) (CA INDEX NAME)

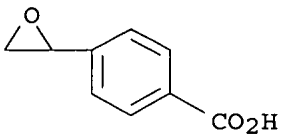


RN 40641-81-4 HCAPLUS
CN Oxiranemethanol, 3-phenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

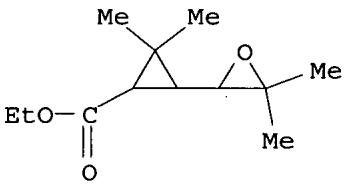
Relative stereochemistry.



RN 159262-71-2 HCAPLUS
CN Benzoic acid, 4-oxiranyl- (9CI) (CA INDEX NAME)

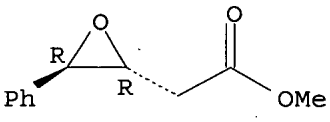


RN 167690-92-8 HCAPLUS
CN Cyclopropanecarboxylic acid, 3-(3,3-dimethyloxiranyl)-2,2-dimethyl-, ethyl ester (9CI) (CA INDEX NAME)

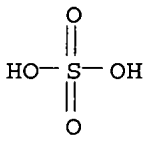


RN 475385-56-9 HCAPLUS
CN Oxiraneacetic acid, 3-phenyl-, methyl ester, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT **10101-53-8**, Chromium (III) sulfate
RL: **CAT (Catalyst use)**; USES (Uses)
(suboptimal metal catalyst for the stereoselective preparation of epoxides by epoxidn. of alkenes in bicarbonate buffer with either tert-butanol or DMF as cosolvents with hydrogen peroxide as the oxidant)
RN 10101-53-8 HCAPLUS
CN Sulfuric acid, chromium(3+) salt (3:2) (6CI, 8CI, 9CI) (CA INDEX NAME)



●2/3 Cr(III)

REFERENCE COUNT: 97 THERE ARE 97 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 10 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:458136 HCAPLUS
DOCUMENT NUMBER: 137:159812
TITLE: Anionic Ligand Effect on the Nature of Epoxidizing Intermediates in Iron Porphyrin Complex-Catalyzed Epoxidation Reactions
AUTHOR(S): Nam, Wonwoo; Jin, Sook Won; Lim, Mi Hee; Ryu, Ju Yeon; Kim, Cheal
CORPORATE SOURCE: Department of Chemistry and Division of Molecular Life Sciences, Ewha Womans University, Seoul, 120-750, S. Korea
SOURCE: Inorganic Chemistry (2002), 41(14), 3647-3652
CODEN: INOCAJ; ISSN: 0020-1669
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The authors have studied an anionic ligand effect in Fe porphyrin complex-catalyzed competitive epoxidns. of cis- and trans-stilbenes by various terminal oxidants and found that the ratios of cis- to trans-stilbene oxide products formed in competitive epoxidns. were markedly dependent on the ligating nature of the anionic ligands. The ratios of cis- to trans-stilbene oxides obtained in the reactions of Fe(TPP)X (TPP = meso-tetraphenylporphinato dianion and X- = anionic ligand) and iodosylbenzene (PhIO) were 14 and 0.9 when the X- of Fe(TPP)X was Cl- and CF3SO3-, resp. An anionic ligand effect was also observed in the reactions of an electron-deficient Fe(III) porphyrin complex containing a number of different anionic ligands, Fe(TPFPP)X [TPFPP = meso-tetrakis(pentafluorophenyl)porphinato dianion and X- = anionic ligand], and various terminal oxidants such as PhIO, m-chloroperoxybenzoic acid (m-CPBA), Bu4N oxone (TBAO), and H2O2. While high ratios of cis- to trans-stilbene oxides were obtained in the reactions of Fe porphyrin catalysts containing ligating anionic ligands such as Cl- and OAc-, the ratios of cis- to trans-stilbene oxide were low in the reactions of Fe porphyrin complexes containing nonligating or weakly ligating anionic ligands such as SbF6-, CF3SO3-, and ClO4-. When the anionic ligand was NO3-, the product ratios depend on terminal oxidants and olefin concns. Probably the dependence of the product ratios on the anionic ligands of Fe(III) porphyrin catalysts is due to the involvement of different reactive species in olefin epoxidn. reactions. That is, high-valent Fe(IV) oxo porphyrin cation radicals are generated as a reactive species in the reactions of Fe porphyrin catalysts containing nonligating or weakly ligating anionic ligands such as SbF6-, CF3SO3-, and ClO4-, whereas oxidant-Fe(III) porphyrin complexes are the reactive intermediates in the reactions of Fe porphyrin catalysts containing ligating anionic ligands such as Cl- and OAc-.

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 25

IT **Epoxidation catalysts**
(epoxidn. of stilbenes in presence of iron porphyrin acido complexes as)

IT **Epoxidation**
(of stilbenes in presence of iron porphyrin acido complexes as catalysts)

IT **103-30-0**, trans-Stilbene **645-49-8**, cis-Stilbene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(anionic ligand effect on nature of epoxidizing intermediates in iron porphyrin complex-catalyzed epoxidn. reactions)

IT 79968-43-7 **94890-04-7** **445241-16-7** 445241-17-8

RL: **CAT (Catalyst use)**; USES (Uses)
(anionic ligand effect on nature of epoxidizing intermediates in transition metal porphyrin complex-catalyzed epoxidn. reactions)

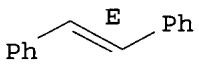
IT 536-80-1, Iodosobenzene **937-14-4 7722-84-1**, Hydrogen peroxide, reactions 88505-29-7, Tetrabutylammonium persulfate
RL: **RGT (Reagent)**; **RACT (Reactant or reagent)**
(oxidant in epoxidn. of stilbenes in presence of transition metal porphyrin complexes in relation to anionic ligand effect)

IT **1439-07-2P**, trans-Stilbene oxide **1689-71-0P**, cis-Stilbene oxide
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation by epoxidn. of stilbene in presence of iron porphyrin complexes in relation to anionic ligand effect)

IT **103-30-0**, trans-Stilbene **645-49-8**, cis-Stilbene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(anionic ligand effect on nature of epoxidizing intermediates in iron porphyrin complex-catalyzed epoxidn. reactions)

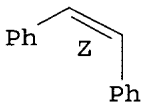
RN 103-30-0 HCAPLUS
CN Benzene, 1,1'-(1E)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



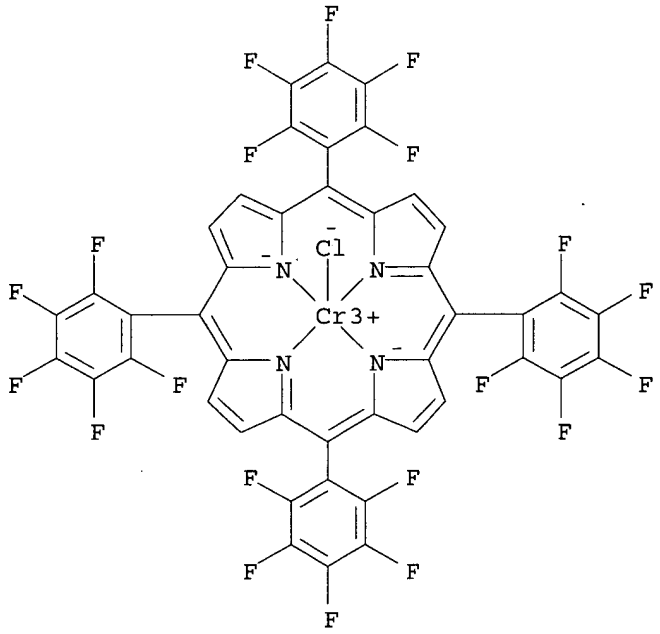
RN 645-49-8 HCAPLUS
CN Benzene, 1,1'-(1Z)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



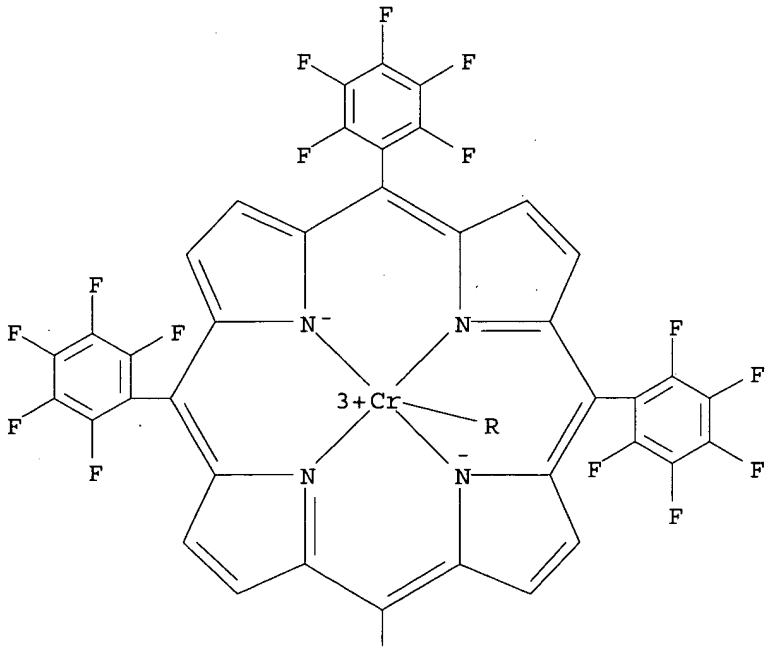
IT **94890-04-7 445241-16-7**
RL: **CAT (Catalyst use)**; USES (Uses)
(anionic ligand effect on nature of epoxidizing intermediates in transition metal porphyrin complex-catalyzed epoxidn. reactions)

RN 94890-04-7 HCAPLUS
CN Chromium, chloro[5,10,15,20-tetrakis(pentafluorophenyl)-21H,23H-porphinato(2-)-κN21,κN22,κN23,κN24]-, (SP-5-12)-
(9CI) (CA INDEX NAME)

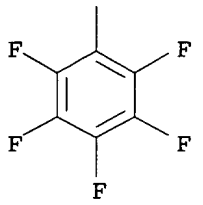


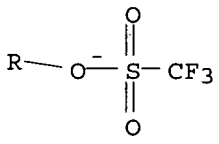
RN 445241-16-7 HCAPLUS
CN Chromium, [5,10,15,20-tetrakis(pentafluorophenyl)-21H,23H-porphinato(2-)-κN21,κN22,κN23,κN24](trifluoromethanesulfonato-κO)-, (SP-5-12)- (9CI) (CA INDEX NAME)

PAGE 1-A

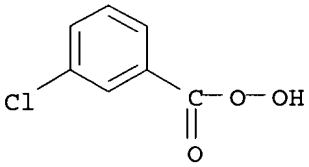


PAGE 2-A

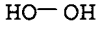




IT **937-14-4 7722-84-1**, Hydrogen peroxide, reactions
RL: **RGT (Reagent)**; **RACT (Reactant or reagent)**
(oxidant in epoxidn. of stilbenes in presence of transition metal porphyrin complexes in relation to anionic ligand effect)
RN 937-14-4 HCAPLUS
CN Benzenecarboperoxoic acid, 3-chloro- (9CI) (CA INDEX NAME)

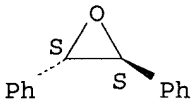


RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)



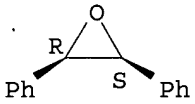
IT **1439-07-2P**, trans-Stilbene oxide **1689-71-0P**, cis-Stilbene oxide
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation by epoxidn. of stilbene in presence of iron porphyrin complexes in relation to anionic ligand effect)
RN 1439-07-2 HCAPLUS
CN Oxirane, 2,3-diphenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 1689-71-0 HCAPLUS
CN Oxirane, 2,3-diphenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 11 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:47125 HCAPLUS
DOCUMENT NUMBER: 137:48815
TITLE: Preparation of metal ion-planted mesoporous silica by template ion-exchange method and its catalytic activity for asymmetric oxidation of sulfide
AUTHOR(S): Iwamoto, Masakazu; Tanaka, Yasuhiro
CORPORATE SOURCE: Chemical Resources Laboratory, Tokyo Institute of Technology, Yokohama, 226-8503, Japan
SOURCE: Catalysis Surveys from Japan (2001), 5(1), 25-36
CODEN: CSURFY; ISSN: 1384-6574
PUBLISHER: Kluwer Academic/Plenum Publishers
DOCUMENT TYPE: Journal
LANGUAGE: English
AB For the preparation of metal ion-planted MCM-41 we have developed a template ion-exchange method, in which the template ions of as-synthesized MCM-41 are exchanged for the metal ions in aqueous media. The cations of Al, Ti, Cr, Mn, Zn, and Zr could be incorporated with high dispersion, while those of Fe, Co, Ni, Cu, Ga, Pd, and Pt formed small particles on the outside of the MCM-41 particles. Investigation on the time course of the template ion-exchange process suggested that the exchange proceeded first between the template ion and a proton and subsequently between the proton and a metal cation. Among the resulting metal ion-planted MCM-41s, Mn-MCM-41 showed excellent activity for the epoxidn. of aromatic olefins. Trans-stilbene oxide was obtained in 93% yield from stilbene in MeCN-DMF solution at 328 K for 96 h. Ti-MCM-41 was the most suitable catalyst for the oxidation of sulfide with H2O2. It should be noted that the oxidation proceeded asym. on Ti-MCM-41 in the presence of optically active tartaric acid in a CH2Cl2 solution The chemical yield and optical yield of sulfoxide reached 54 and 30% ee, resp.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
IT **Epoxidation**
Epoxidation catalysts
Solvent effect
(preparation of metal ion-planted mesoporous silica by template ion-exchange

method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

IT 7429-90-5P, Aluminum, preparation 7439-89-6P, Iron, preparation 7439-96-5P, Manganese, preparation 7440-02-0P, Nickel, preparation 7440-05-3P, Palladium, preparation 7440-06-4P, Platinum, preparation 7440-32-6P, Titanium, preparation **7440-47-3P**, Chromium, preparation 7440-48-4P, Cobalt, preparation 7440-50-8P, Copper, preparation 7440-55-3P, Gallium, preparation 7440-66-6P, Zinc, preparation 7440-67-7P, Zirconium, preparation
RL: **CAT (Catalyst use)**; PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(MCM-41 planted with; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

IT **75-91-2**, tert-Butyl hydroperoxide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of trans-stilbene with; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

IT **103-30-0**, trans-Stilbene **645-49-8**, cis-Stilbene **1657-45-0**, cis-4-Methylstilbene **1657-49-4**, cis-4-Chlorostilbene **1657-50-7**, trans-4-Chlorostilbene **1860-17-9**, trans-4-Methylstilbene **2840-89-3** **3132-88-5 20374-76-9 30270-24-7**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

IT **1439-07-2P**, trans-Stilbene oxide
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(from oxidation of trans-stilbene; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

IT 594-43-4P, Methyl ethyl sulfone 833-82-9P, Phenyl benzyl sulfoxide 934-71-4P, 4-Bromophenyl methyl sulfoxide 934-72-5P, 4-Methylphenyl methyl sulfoxide 940-12-5P, 4-Nitrophenyl methyl sulfoxide 1669-98-3P, Methyl ethyl sulfoxide 2976-30-9P, 4-Nitrophenyl methyl sulfone 3112-88-7P, Phenyl benzyl sulfone 3185-99-7P 3466-32-8P, 4-Bromophenyl methyl sulfone **28291-09-0P 28291-10-3P** **42730-01-8P 59502-09-9P 70332-50-2P 21324** **8-84-1P 438591-24-3P 438591-25-4P**
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

IT **7440-47-3P**, Chromium, preparation
RL: **CAT (Catalyst use)**; PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(MCM-41 planted with; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)

RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

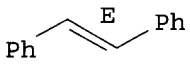
Cr

IT **75-91-2**, tert-Butyl hydroperoxide
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(epoxidn. of trans-stilbene with; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)

HO—O—Bu-t

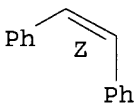
IT **103-30-0**, trans-Stilbene **645-49-8**, cis-Stilbene
1657-45-0, cis-4-Methylstilbene **1657-49-4**,
cis-4-Chlorostilbene **1657-50-7**, trans-4-Chlorostilbene
1860-17-9, trans-4-Methylstilbene **2840-89-3**
3132-88-5 20374-76-9 30270-24-7
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(epoxidn. of; preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)
RN 103-30-0 HCAPLUS
CN Benzene, 1,1'-(1E)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



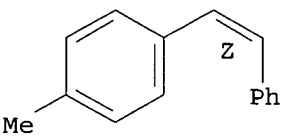
RN 645-49-8 HCAPLUS
CN Benzene, 1,1'-(1Z)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



RN 1657-45-0 HCAPLUS
CN Benzene, 1-methyl-4-[(1Z)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

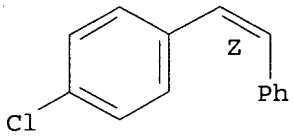
Double bond geometry as shown.



RN 1657-49-4 HCAPLUS

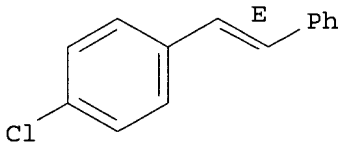
CN Benzene, 1-chloro-4-[(1Z)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



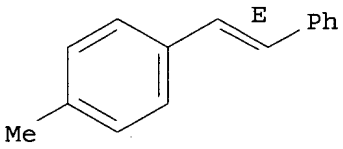
RN 1657-50-7 HCAPLUS
CN Benzene, 1-chloro-4-[(1E)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



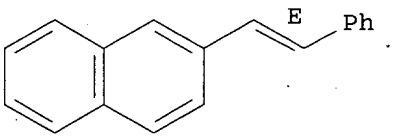
RN 1860-17-9 HCAPLUS
CN Benzene, 1-methyl-4-[(1E)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



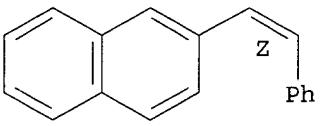
RN 2840-89-3 HCAPLUS
CN Naphthalene, 2-[(1E)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



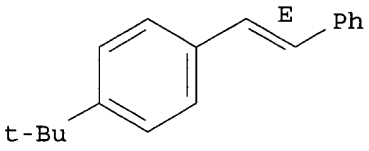
RN 3132-88-5 HCAPLUS
CN Naphthalene, 2-[(1Z)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



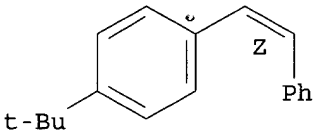
RN 20374-76-9 HCAPLUS
CN Benzene, 1-(1,1-dimethylethyl)-4-[(1E)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



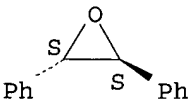
RN 30270-24-7 HCAPLUS
CN Benzene, 1-(1,1-dimethylethyl)-4-[(1Z)-2-phenylethenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT **1439-07-2P**, trans-Stilbene oxide
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(from oxidation of trans-stilbene; preparation of metal ion-planted mesoporous
silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn. of aromatic olefins)
RN 1439-07-2 HCAPLUS
CN Oxirane, 2,3-diphenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

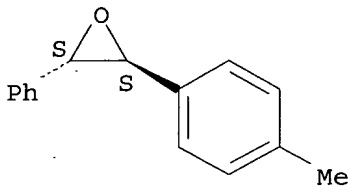
Relative stereochemistry.



IT **28291-09-0P 28291-10-3P 42730-01-8P**
59502-09-9P 70332-50-2P 213248-84-1P
438591-24-3P 438591-25-4P
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(preparation of metal ion-planted mesoporous silica by template ion-exchange method and catalytic activity for asym. oxidation of sulfide and epoxidn.

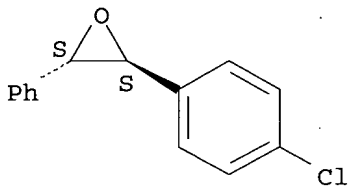
of aromatic olefins)
RN 28291-09-0 HCAPLUS
CN Oxirane, 2-(4-methylphenyl)-3-phenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



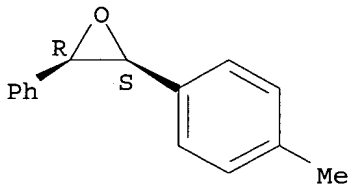
RN 28291-10-3 HCAPLUS
CN Oxirane, 2-(4-chlorophenyl)-3-phenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



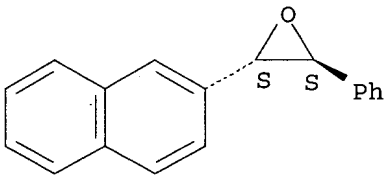
RN 42730-01-8 HCAPLUS
CN Oxirane, 2-(4-methylphenyl)-3-phenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



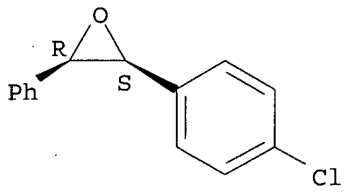
RN 59502-09-9 HCAPLUS
CN Oxirane, 2-(2-naphthalenyl)-3-phenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



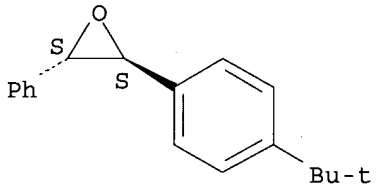
RN 70332-50-2 HCAPLUS
CN Oxirane, 2-(4-chlorophenyl)-3-phenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



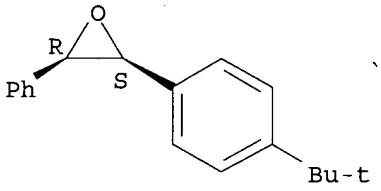
RN 213248-84-1 HCAPLUS
CN Oxirane, 2-[4-(1,1-dimethylethyl)phenyl]-3-phenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



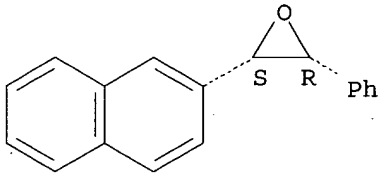
RN 438591-24-3 HCAPLUS
CN Oxirane, 2-[4-(1,1-dimethylethyl)phenyl]-3-phenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 438591-25-4 HCAPLUS
CN Oxirane, 2-(2-naphthalenyl)-3-phenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



REFERENCE COUNT: 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 12 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:512467 HCAPLUS
DOCUMENT NUMBER: 135:242611
TITLE: Preparation of dendritic and non-dendritic styryl-substituted Salens for cross-linking suspension copolymerization with styrene and multiple use of the corresponding Mn and Cr complexes in enantioselective epoxidations and hetero-Diels-Alder reactions
AUTHOR(S): Sellner, Holger; Karjalainen, Jaana K.; Seebach, Dieter
CORPORATE SOURCE: Laboratorium fur Organische Chemie der Eidgenossischen Technischen Hochschule Zurich ETH Zentrum, Zurich, 8092, Switz.
SOURCE: Chemistry--A European Journal (2001), 7(13), 2873-2887
CODEN: CEUJED; ISSN: 0947-6539
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Following work with TAD-DOLs and BINOLs, we have now prepared Salen derivs. (2, 3, 14, 15, 18, 19, 20, 21) carrying two to eight styryl groups for crosslinking copolymn. with styrene. The Salen cores are either derived from (R,R)-diphenyl ethylene diamine (3, 15, 19, 21) or from (R,R)-cyclohexane diamine (2, 14, 18, 20). The styryl groups are attached to the salicylic aldehyde moieties, using Suzuki (cf. 1) or Sonogashira cross-coupling (cf. 11), and/or phenolic etherification (cf. 5, 7) with dendritic styryl-substituted Frechet-type benzylic branch bromides. Subsequent condensation with the diamines provides the chiral Salens. Corresponding Salens lacking the peripheral vinyl groups (cf. 12, 13, 16, 17) were also prepared for comparison of catalytic activities in homogeneous solution with those in polystyrene. Crosslinking radical suspension copolymn. of styrene and styryl Salens, following a procedure by Itsuno and Frechet, gave beads (ca. 400 μm diameter) which were loaded with Mn or Cr (ca. 0.2 mmol of complex per g of polymer), with more than 95% of the Salen incorporated being actually accessible for complexation (by elemental anal.). The polymer-bound Mn and Cr complexes were used as catalysts for epoxidns. of six phenyl-substituted olefins (m-CPBA/NMO; products 22a-f), and for dihydropyranone formation from the Danishefsky diene and aldehydes (PhCHO, C5H11CHO, C6H11CHO, products 23a-c). There are several remarkable features of the novel immobilized Salens: (i) The dendritic branches do not slow down the catalytic activity of the complexes in solution; (ii) the reactions with Salen catalysts incorporated in polystyrene give products of essentially the same enantiopurity as those observed in homogeneous solution with the dendritically substituted or with the original Jacobsen-Katsuki complexes; (iii) some Mn-loaded beads have been stored for a year, without loss of activity; (iv) especially the biphenyl- and acetylene-linked Salen polymers (p-2, -3, -20, -21, Figure 2, 3) give Mn complexes of excellent performance: after ten uses (without re-charging with Mn!) there is no loss of enantioselectivity or degree of conversion under the standard conditions.

CC 35-5 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 23, 76

IT **Epoxidation catalysts**
(stereoselective; dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes in enantioselective epoxidns. and hetero-Diels-Alder reactions)

IT **360785-07-5P 360785-08-6P 360785-11-1P**
360785-12-2P 360785-13-3P 360785-14-4P
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(crosslinking agent; preparation of dendritic and non-dendritic styryl-substituted salens)

IT **360784-96-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(crosslinking agent; preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)

IT **360784-95-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(crosslinking agent; preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)

IT **937-14-4**, m-Chloroperbenzoic acid
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. agent; preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in enantioselective epoxidns. and hetero-Diels-Alder reactions)

IT **96-09-3P**, Styrene oxide 2461-34-9P **2783-26-8P**, 2-MethylStyrene oxide **4436-22-0P** 4829-01-0P, 1-Phenylcyclohexene oxide **17619-97-5P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(epoxidn. product; preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in enantioselective epoxidns. and hetero-Diels-Alder reactions)

IT **100-42-5**, Styrene, reactions **100-80-1**, 3-Methylstyrene **103-30-0**, trans-Stilbene 771-98-2, 1-Phenylcyclohexene **873-66-5** 29828-28-2, Dihydronaphthalene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. substrate; preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in enantioselective epoxidns. and hetero-Diels-Alder reactions)

IT **54125-02-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(hetero-Diels-Alder reaction over dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Cr complexes)

IT **7440-47-3DP**, Chromium, complexes with chiral styryl-containing dendritic salen-crosslinked polystyrene, preparation
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in hetero-Diels-Alder reactions)

IT 540-38-5, 4-Iodophenol 638-38-0, Manganese acetate 1066-54-2, Ethynyltrimethylsilane 129536-41-0 **199277-76-4** **199277-79-7**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens)

IT 360784-97-0P **360784-98-1P 360784-99-2P** 360785-00-8P 360785-01-9P 360785-02-0P **360785-03-1P 360785-04-2P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens)

IT **2156-04-9** 20439-47-8 24131-32-6 35132-20-8 153759-58-1

192803-37-5
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)

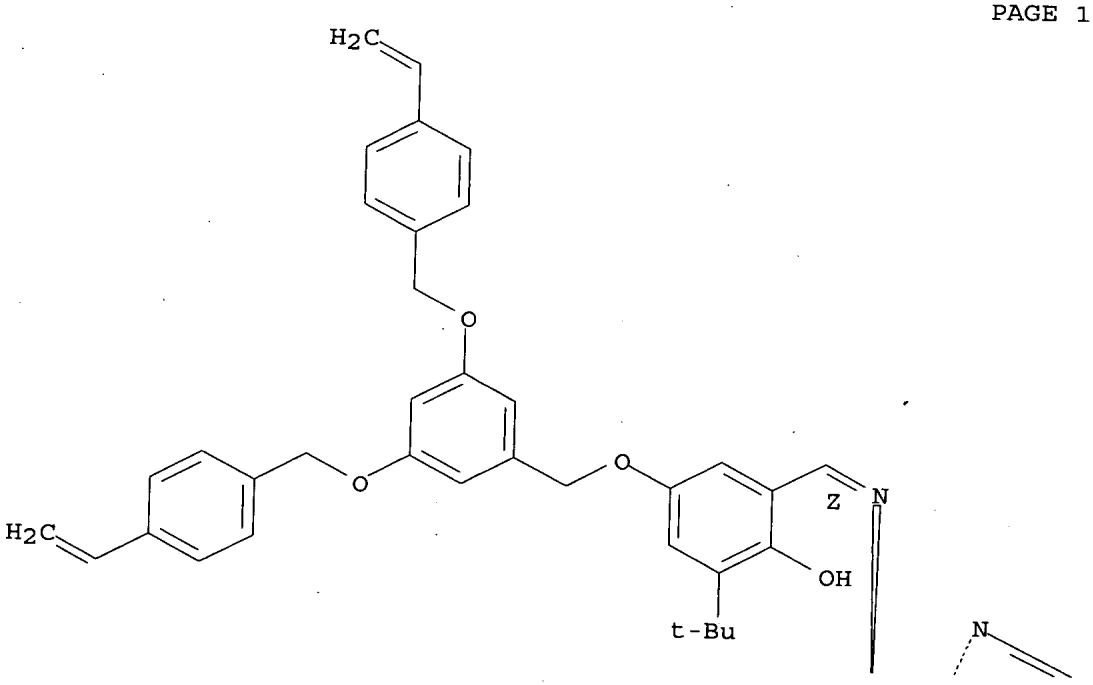
IT **360784-94-7P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)

IT **360785-07-5P 360785-08-6P 360785-11-1P 360785-12-2P 360785-13-3P 360785-14-4P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(crosslinking agent; preparation of dendritic and non-dendritic styryl-substituted salens)

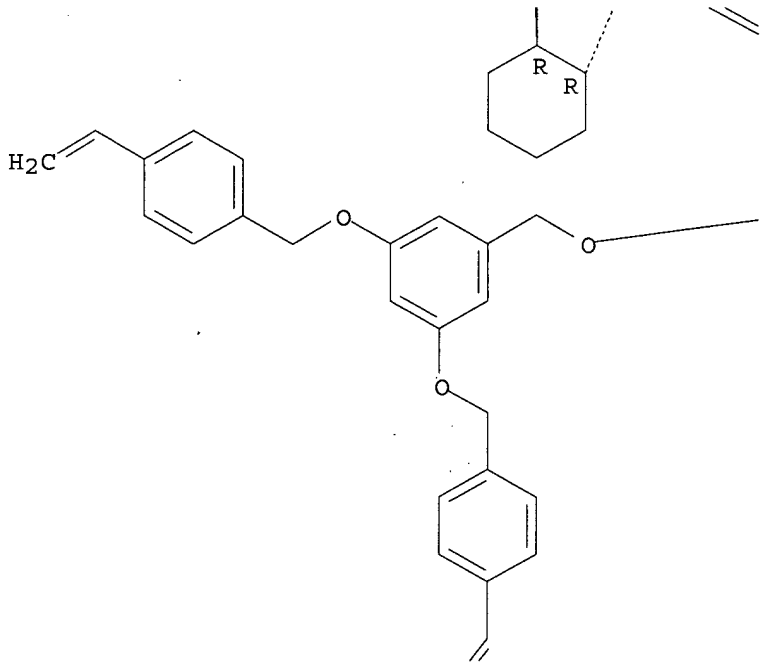
RN 360785-07-5 HCAPLUS
CN Phenol, 2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(Z)-nitrilomethylidyne]]bis[4-[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]-6-(1,1-dimethylethyl)-(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).
Double bond geometry as shown.

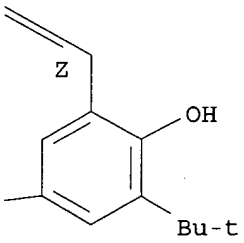
PAGE 1-A



PAGE 2-A



PAGE 2-B

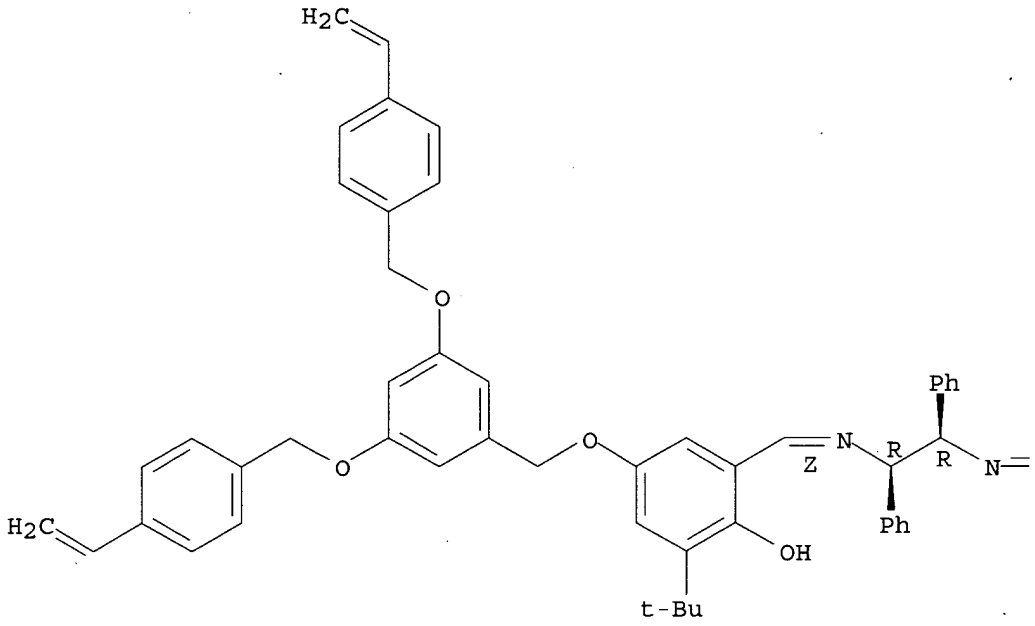


PAGE 3-A

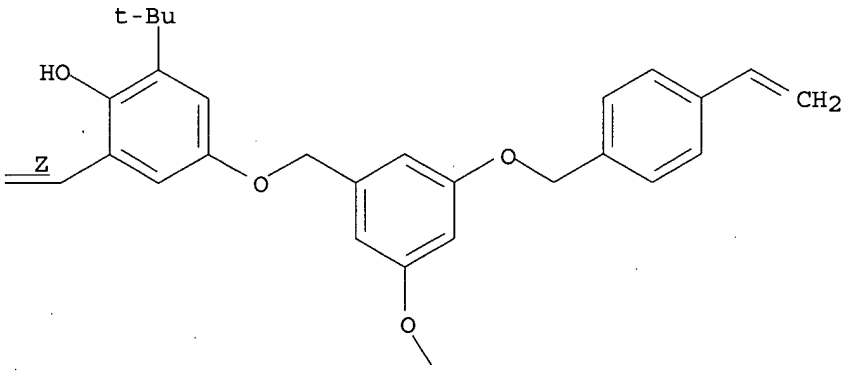
RN 360785-08-6 HCAPLUS
CN Phenol, 2,2'-[[(1R,2R)-1,2-diphenyl-1,2-ethanediyl]bis[(Z)-nitrilomethylidyne]]bis[4-[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]-6-(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).
Double bond geometry as shown.

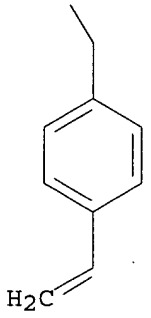
PAGE 1-A



PAGE 1-B



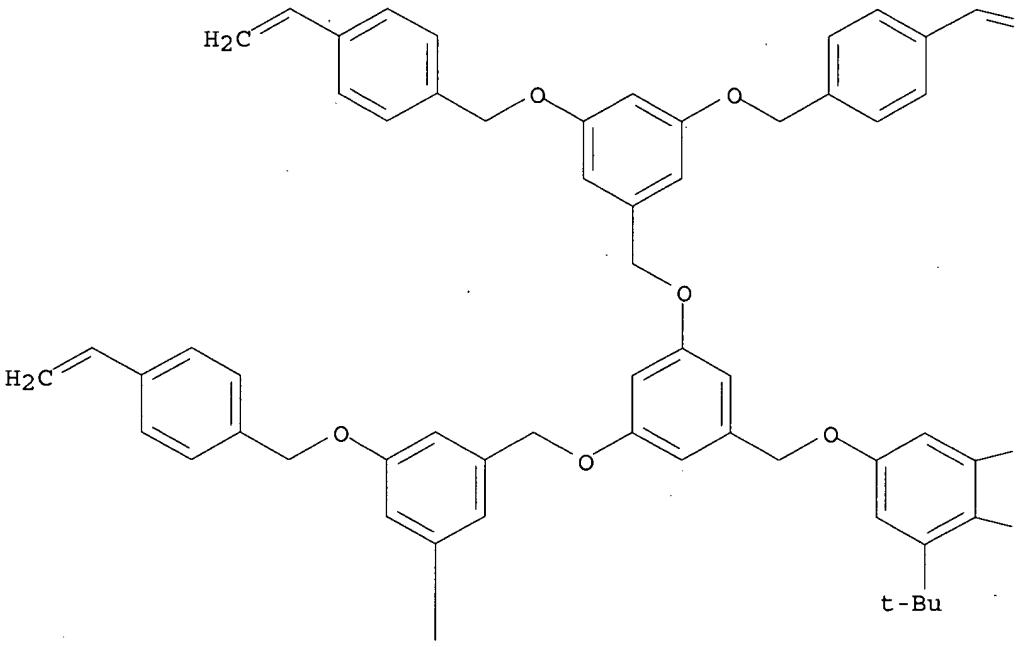
PAGE 2-B



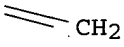
RN 360785-11-1 HCAPLUS
CN Phenol, 2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(Z)-nitrilomethylidyne]]bis[4-[[3,5-bis[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]phenyl]methoxy]-6-(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)

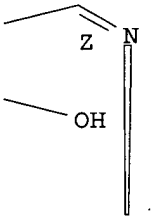
Absolute stereochemistry. Rotation (-).
Double bond geometry as shown.

PAGE 1-A

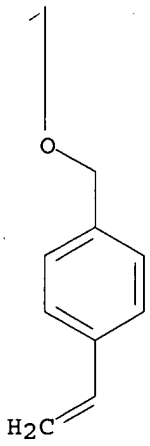


PAGE 1-B

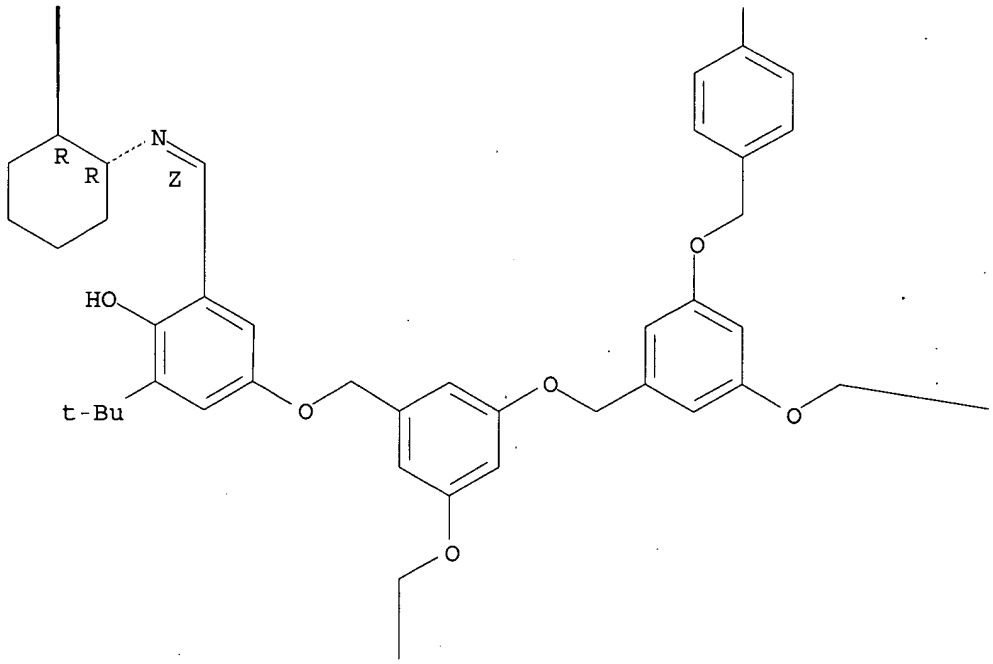




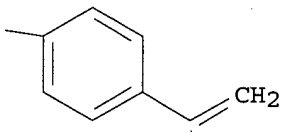
PAGE 2-A



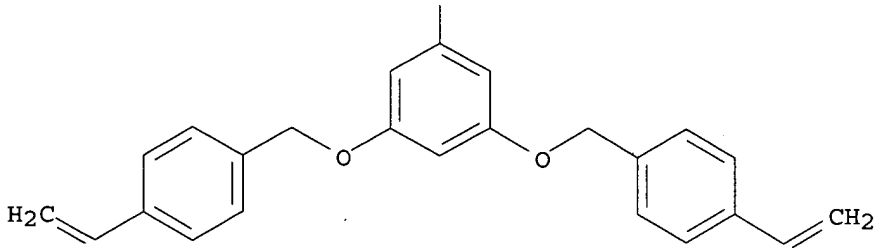
PAGE 2-B



PAGE 2-C



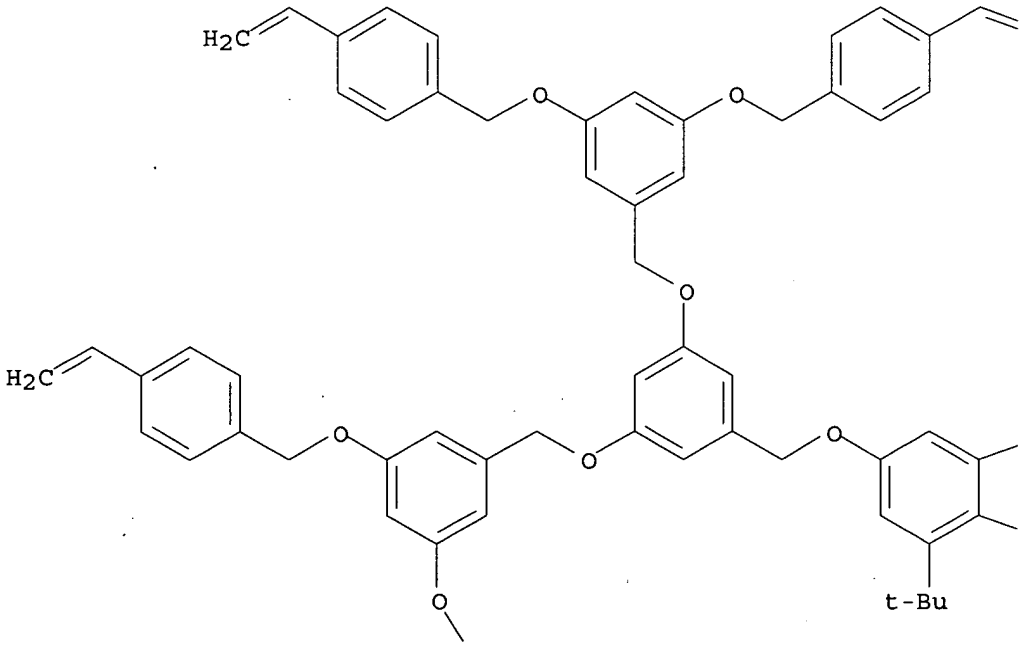
PAGE 3-B



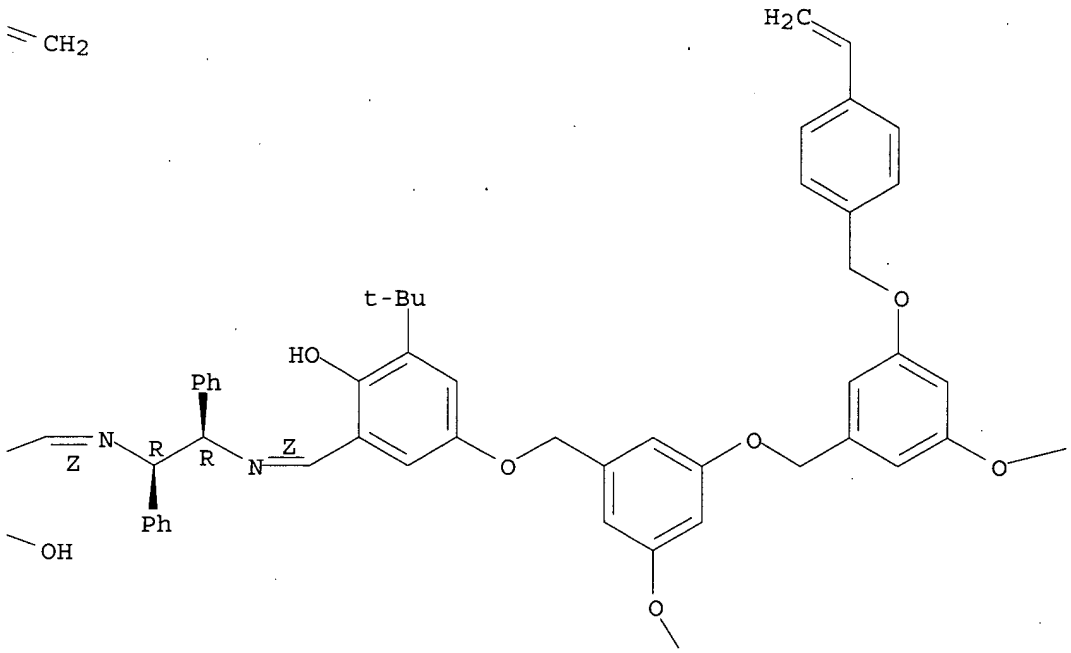
RN 360785-12-2 HCAPLUS
CN Phenol, 2,2'-[[(1R,2R)-1,2-diphenyl-1,2-ethanediyl]bis[(Z)-nitrilomethylidyne]]bis[4-[[3,5-bis[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]phenyl]methoxy]-6-(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).
Double bond geometry as shown.

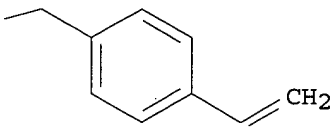
PAGE 1-A



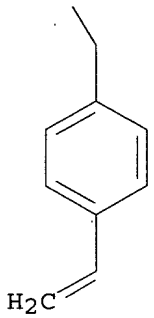
PAGE 1-B



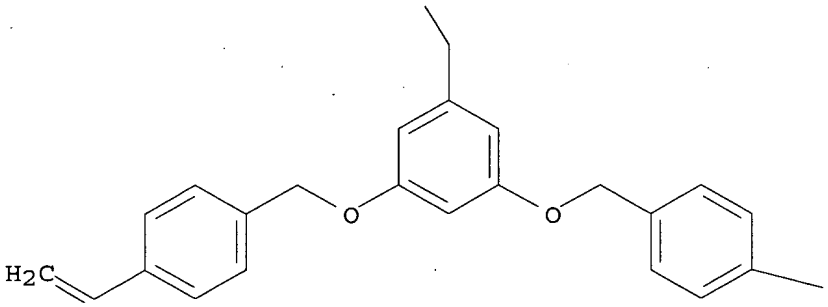
PAGE 1-C



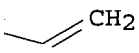
PAGE 2-A



PAGE 2-B



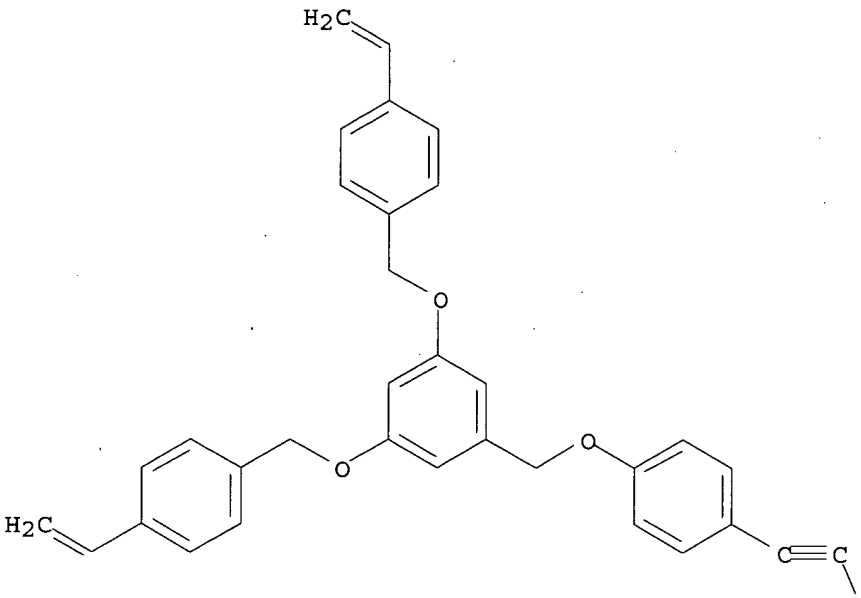
PAGE 2-C



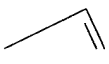
RN 360785-13-3 HCAPLUS
CN Phenol, 2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(Z)-nitrilomethylidyne]]bis[4-[[4-[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]phenyl]ethynyl]-6-(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).
Double bond geometry as shown.

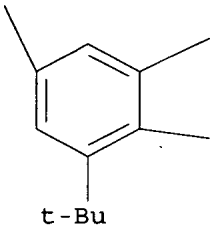
PAGE 1-A

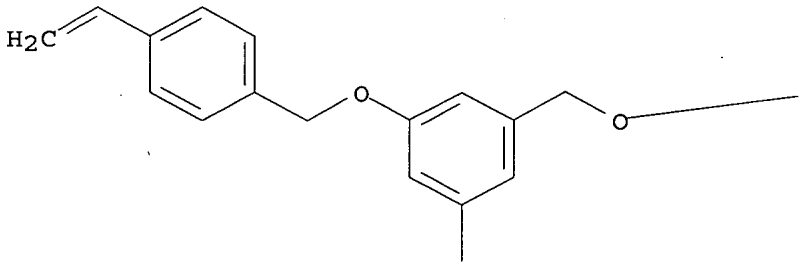


PAGE 1-B

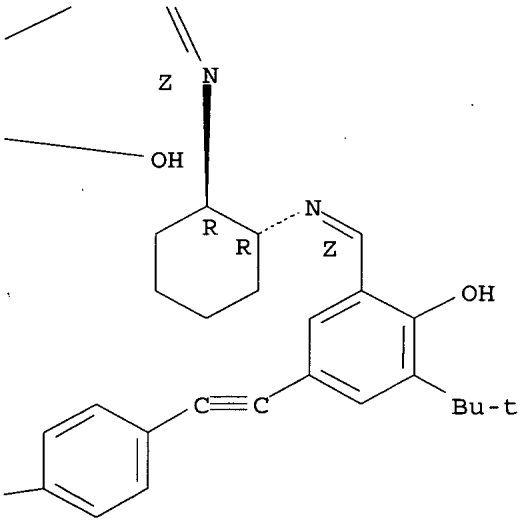


PAGE 2-A

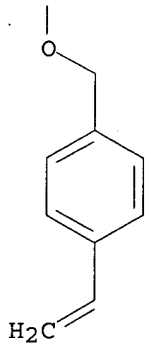




PAGE 2-B



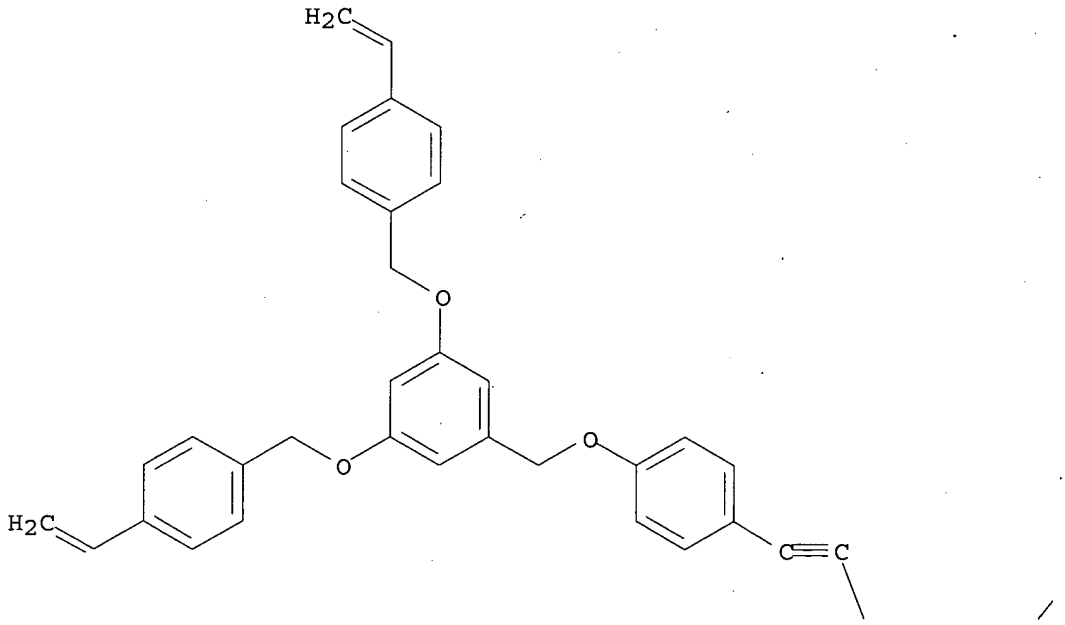
PAGE 3-A



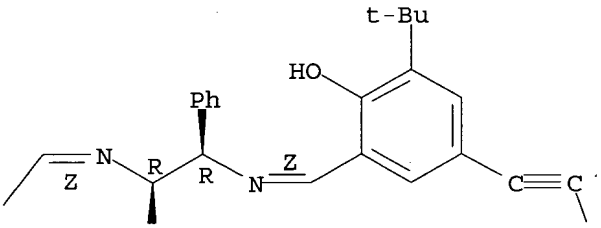
RN 360785-14-4 HCAPLUS
CN Phenol, 2,2'-[[(1R,2R)-1,2-diphenyl-1,2-ethanediyl]bis[(Z)-nitrilomethylidyne]]bis[4-[[4-[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]phenyl]ethynyl]-6-(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).
Double bond geometry as shown.

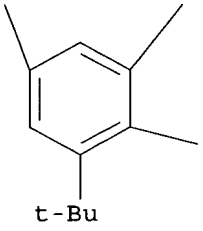
PAGE 1-A



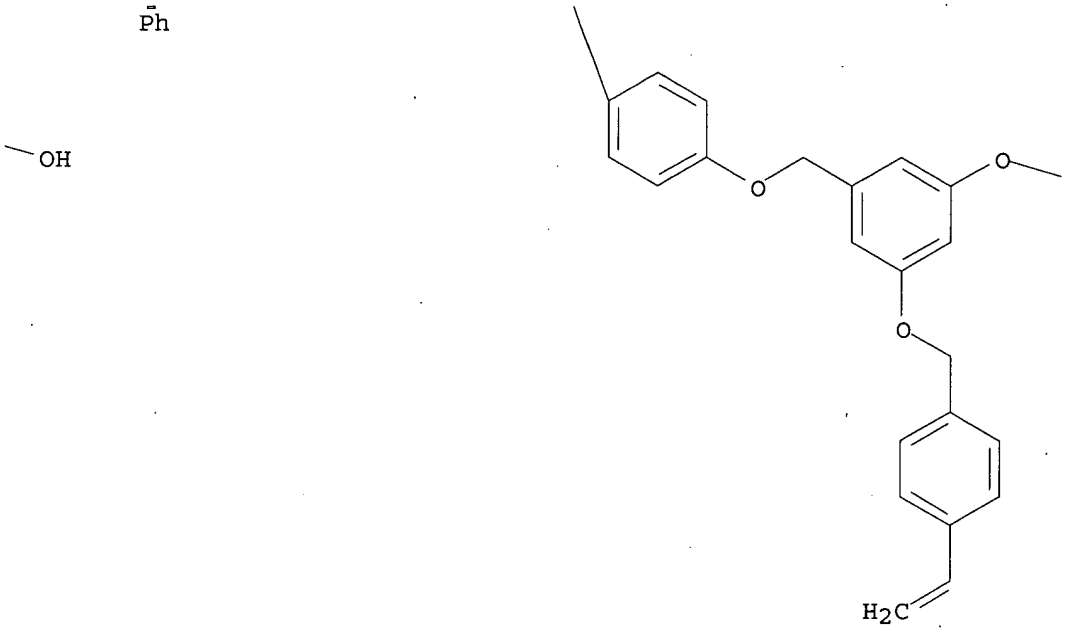
PAGE 1-B



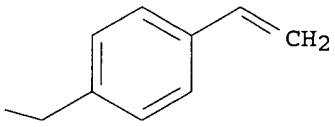
PAGE 2-A



PAGE 2-B



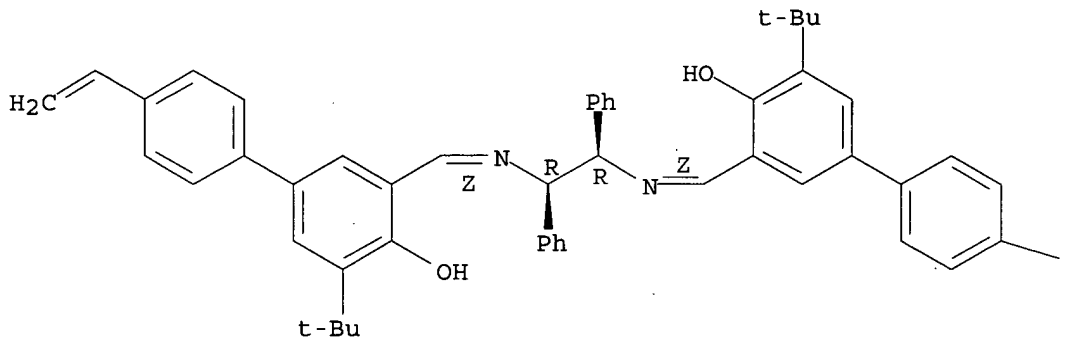
PAGE 2-C



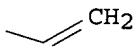
IT **360784-96-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(crosslinking agent; preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)
RN 360784-96-9 HCAPLUS
CN [1,1'-Biphenyl]-4-ol, 3,3''-[[(1R,2R)-1,2-diphenyl-1,2-ethanediyl]bis[(Z)-nitrilomethylidyne]]bis[5-(1,1-dimethylethyl)-4'-ethenyl- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).
Double bond geometry as shown.

PAGE 1-A

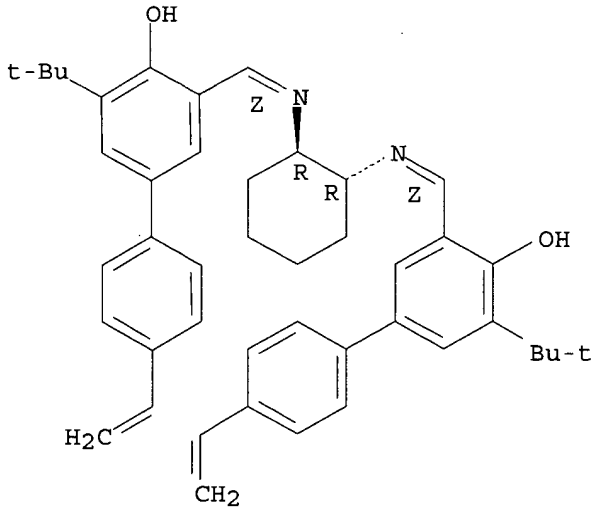


PAGE 1-B

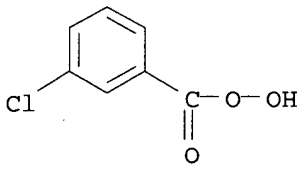


IT **360784-95-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(crosslinking agent; preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)
RN 360784-95-8 HCAPLUS
CN [1,1'-Biphenyl]-4-ol, 3,3''-[(1R,2R)-1,2-cyclohexanediylbis[(Z)-nitrilomethylidyne]]bis[5-(1,1-dimethylethyl)-4'-ethenyl- (9CI) (CA INDEX NAME)

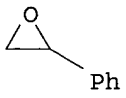
Absolute stereochemistry. Rotation (+).
Double bond geometry as shown.



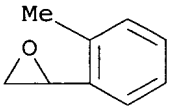
IT **937-14-4**, m-Chloroperbenzoic acid
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. agent; preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in enantioselective epoxidns. and hetero-Diels-Alder reactions)
RN 937-14-4 HCAPLUS
CN Benzenecarboperoxoic acid, 3-chloro- (9CI) (CA INDEX NAME)



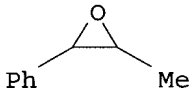
IT **96-09-3P**, Styrene oxide **2783-26-8P**, 2-MethylStyrene oxide **4436-22-0P 17619-97-5P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(epoxidn. product; preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in enantioselective epoxidns. and hetero-Diels-Alder reactions)
RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)



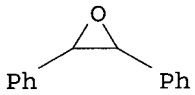
RN 2783-26-8 HCAPLUS
CN Oxirane, (2-methylphenyl)- (9CI) (CA INDEX NAME)



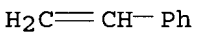
RN 4436-22-0 HCAPLUS
CN Oxirane, 2-methyl-3-phenyl- (9CI) (CA INDEX NAME)



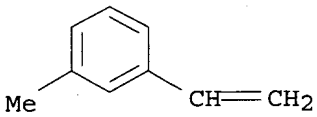
RN 17619-97-5 HCAPLUS
CN Oxirane, 2,3-diphenyl- (9CI) (CA INDEX NAME)



IT **100-42-5**, Styrene, reactions **100-80-1**, 3-Methylstyrene
103-30-0, trans-Stilbene **873-66-5**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. substrate; preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in enantioselective epoxidns. and hetero-Diels-Alder reactions)
RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)

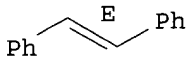


RN 100-80-1 HCAPLUS
CN Benzene, 1-ethenyl-3-methyl- (9CI) (CA INDEX NAME)



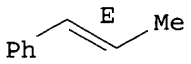
RN 103-30-0 HCAPLUS
CN Benzene, 1,1'-(1E)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



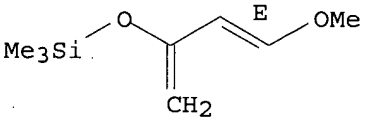
RN 873-66-5 HCAPLUS
CN Benzene, (1E)-1-propenyl- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT **54125-02-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(hetero-Diels-Alder reaction over dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Cr complexes)
RN 54125-02-9 HCAPLUS
CN Silane, [[(2E)-3-methoxy-1-methylene-2-propenyl]oxy]trimethyl- (9CI) (CA INDEX NAME)

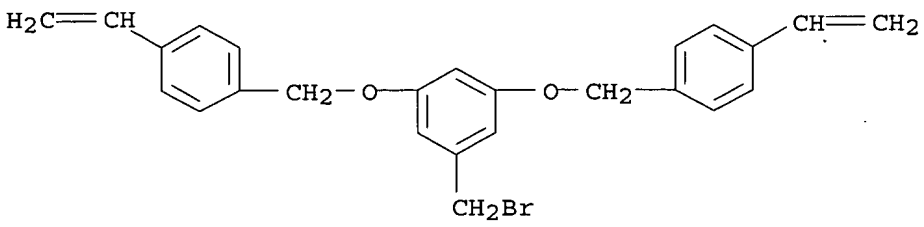
Double bond geometry as shown.



IT **7440-47-3DP**, Chromium, complexes with chiral styryl-containing dendritic salen-crosslinked polystyrene, preparation
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of dendritic and non-dendritic styryl-substituted salen-crosslinked polystyrene Mn and Cr complexes and their use as catalysts in hetero-Diels-Alder reactions)
RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

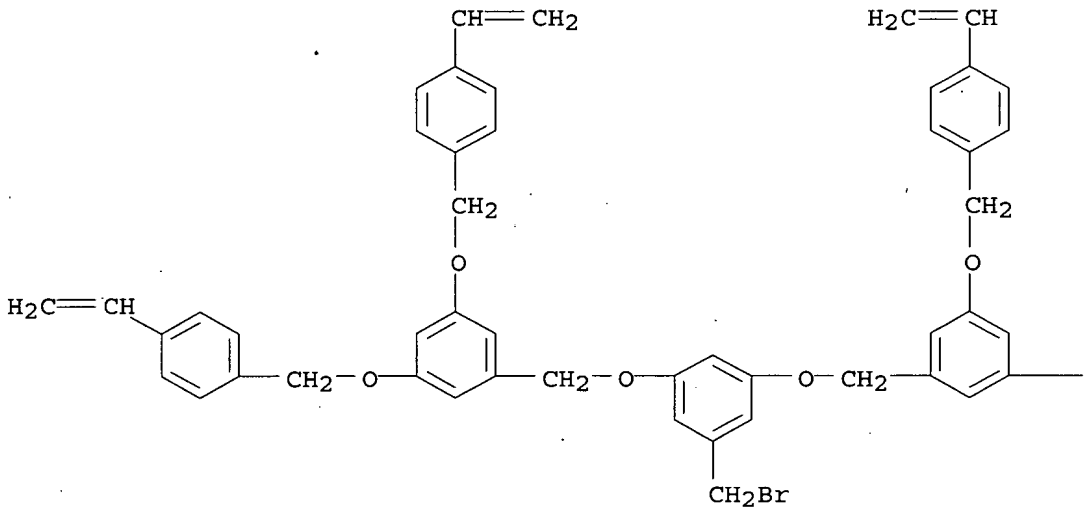
Cr

IT **199277-76-4 199277-79-7**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens)
RN 199277-76-4 HCAPLUS
CN Benzene, 1-(bromomethyl)-3,5-bis[(4-ethenylphenyl)methoxy]- (9CI) (CA INDEX NAME)

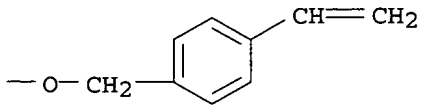


RN 199277-79-7 HCAPLUS
CN Benzene, 1,3-bis[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]-5-(bromomethyl)- (9CI) (CA INDEX NAME)

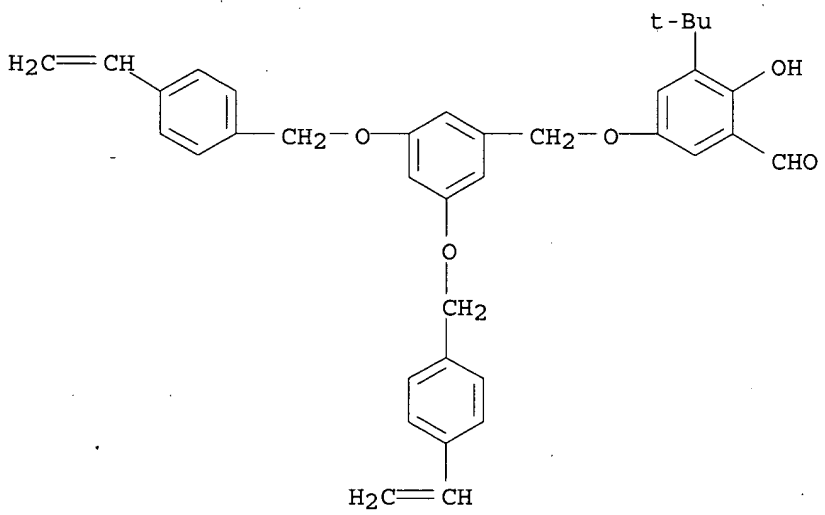
PAGE 1-A



PAGE 1-B

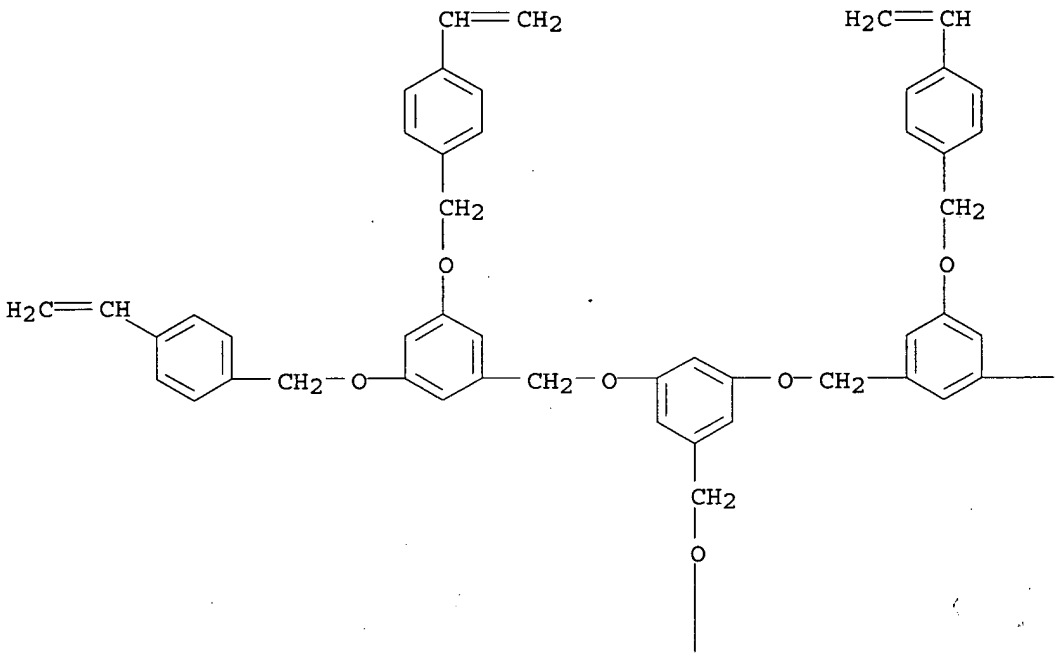


IT **360784-98-1P 360784-99-2P 360785-03-1P**
360785-04-2P
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens)
RN 360784-98-1 HCAPLUS
CN Benzaldehyde, 5-[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]-3-(1,1-dimethylethyl)-2-hydroxy- (9CI) (CA INDEX NAME)

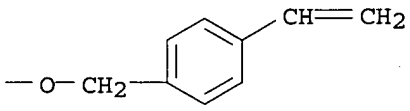


RN 360784-99-2 HCAPLUS
CN Benzaldehyde, 5-[[3,5-bis[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]phenyl]methoxy]-3-(1,1-dimethylethyl)-2-hydroxy- (9CI) (CA INDEX NAME)

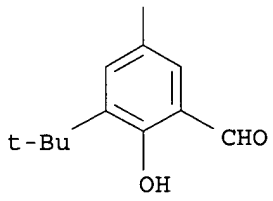
PAGE 1-A



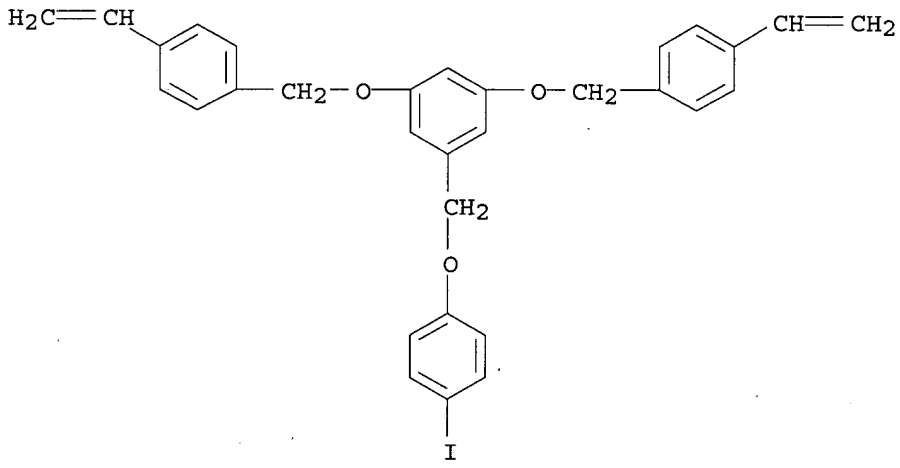
PAGE 1-B



PAGE 2-A

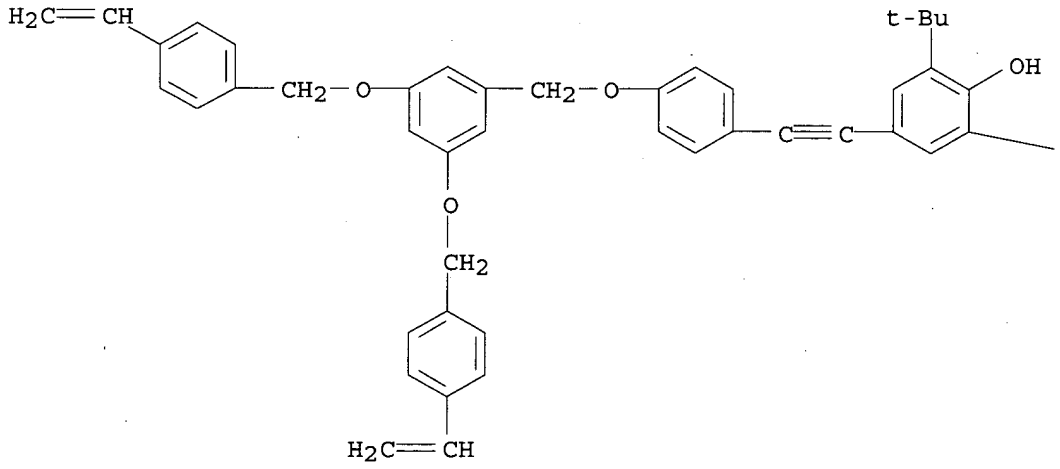


RN 360785-03-1 HCAPLUS
CN Benzene, 1,3-bis[(4-ethenylphenyl)methoxy]-5-[(4-iodophenoxy)methyl]-
(9CI) (CA INDEX NAME)



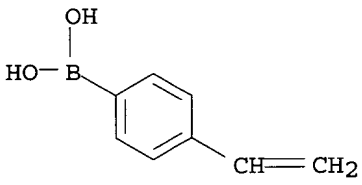
RN 360785-04-2 HCAPLUS
CN Benzaldehyde, 5-[[4-[[3,5-bis[(4-ethenylphenyl)methoxy]phenyl]methoxy]phen
yl]ethynyl]-3-(1,1-dimethylethyl)-2-hydroxy- (9CI) (CA INDEX NAME)

PAGE 1-A

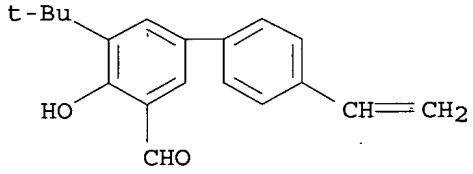


—CHO

IT **2156-04-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)
RN 2156-04-9 HCAPLUS
CN Boronic acid, (4-ethenylphenyl)- (9CI) (CA INDEX NAME)



IT **360784-94-7P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation of dendritic and non-dendritic styryl-substituted salens as crosslinking agents for polystyrene)
RN 360784-94-7 HCAPLUS
CN [1,1'-Biphenyl]-3-carboxaldehyde, 5-(1,1-dimethylethyl)-4'-ethenyl-4-hydroxy- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 82 THERE ARE 82 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 13 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1999:350632 HCAPLUS
DOCUMENT NUMBER: 131:6855
TITLE: Process for the selective oxidation of organic compounds
INVENTOR(S): Singh, Prahlad R.; Tercho, Gerald P.; Wentz, Jack N., Jr.; Olewine, Keith R.
PATENT ASSIGNEE(S): Du Pont Pharmaceuticals Company, USA

SOURCE: PCT Int. Appl., 16 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9925666	A2	19990527	WO 1998-US24180	19981112
WO 9925666	A3	19990910		
W: AU, BR, CA, CN, CZ, EE, HU, IL, JP, KR, LT, LV, MX, NO, NZ, PL, RO, SG, SI, SK, UA, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 1056683	A2	20001206	EP 1998-965958	19981112
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE, SI, LT, LV, FI, RO				
EE 200000234	A	20010615	EE 2000-200000234	19981112
BR 9815311	A	20010807	BR 1998-15311	19981112
JP 2001523651	T2	20011127	JP 2000-521054	19981112
ZA 9810409	A	20000515	ZA 1998-10409	19981113
US 6391279	B1	20020521	US 1998-191672	19981113
NO 2000002406	A	20000509	NO 2000-2406	20000509
PRIORITY APPLN. INFO.:			US 1997-65993P P	19971114
			WO 1998-US24180 W	19981112

OTHER SOURCE(S): MARPAT 131:6855

AB A process for oxidizing organic compds. comprises contacting, in a zone of reaction, an oxidizable organic compound with hydrogen peroxide in the presence of a catalytically effective amount of an insol. catalyst comprising silicon oxide and an oxide of at least one hydrogen peroxide-activating metal, which catalyst has been treated with a silylating agent,and wherein the activity of the treated catalyst is increased by a factor of at least two compared to untreated catalyst. A method for preparing a catalyst using a copolymer of diethoxysilane and Et titanate is also disclosed.

IC ICM C07B

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

IT **Epoxidation catalysts**
Oxidation catalysts
(process for the selective oxidation of organic compds.)

IT 546-68-9, Titanium isopropoxide 681-84-5, Tetramethyl orthosilicate 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-22-4, Silver, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-45-1, Cerium, uses **7440-47-3**, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses 7631-86-9, Silica, uses 17927-72-9 225654-25-1, PSITI 019
RL: **CAT (Catalyst use)**; USES (Uses)
(process for the selective oxidation of organic compds.)

IT 286-62-4P, Cycloocteneoxide **2984-50-1P**, 1,2-Epoxyoctane
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(process for the selective oxidation of organic compds.)

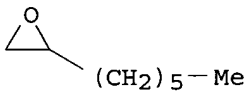
IT **111-66-0**, 1-Octene 931-87-3, cis-Cyclooctene **7722-84-1**, Hydrogen peroxide, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(process for the selective oxidation of organic compds.)

IT **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)

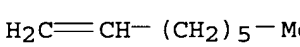
(process for the selective oxidation of organic compds.)
RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT **2984-50-1P**, 1,2-Epoxyoctane
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(process for the selective oxidation of organic compds.)
RN 2984-50-1 HCAPLUS
CN Oxirane, hexyl- (9CI) (CA INDEX NAME)



IT **111-66-0**, 1-Octene **7722-84-1**, Hydrogen peroxide, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(process for the selective oxidation of organic compds.)
RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)



RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)

L49 ANSWER 14 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1998:708359 HCAPLUS
DOCUMENT NUMBER: 130:81126
TITLE: Pyridines as bifunctional co-catalysts in the CrO3-catalyzed oxygenation of olefins by t-butyl hydroperoxide
AUTHOR(S): Rothenberg, Gadi; Wiener, Harold; Sasson, Yoel
CORPORATE SOURCE: Casali Institute of Applied Chemistry, Hebrew University of Jerusalem, Jerusalem, 91904, Israel
SOURCE: Journal of Molecular Catalysis A: Chemical (1998), 136(3), 253-262
CODEN: JMCCF2; ISSN: 1381-1169
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Me3COOH (I) oxidizes olefins to epoxides and allylic oxidation products in

the presence of a Cr(VI) catalyst. A concurrent decomposition of the oxidant occurs. Pyridine-derived additives alter the behavior of this catalytic system: monodentate pyridines and trans-chelated bidentate bipyridines retard I decomposition and arrest the epoxidn. reaction, shifting the product selectivity towards allylic oxidation Adversely, cis-chelated bipyridines accelerate I decomposition Depending on ligand nature and concentration, the initial decomposition rate can be slowed down to 1/8th, or accelerated up to 2 orders of magnitude, (relative to CrO3 catalysis). Allylic oxidation and I decomposition are free-radical reactions, but the epoxidn. is evidently not. A reaction mechanism is proposed, where the diverse role of the pyridine ligands is attributed to specific complex formations.

CC 22-7 (Physical Organic Chemistry)
Section cross-reference(s): 67

IT Decomposition
Decomposition catalysts
Epoxidation
Epoxidation catalysts
Oxidation catalysts
Oxygenation
Safety
(pyridines as bifunctional cocatalysts in chromic acid-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)

IT **75-91-2**, tert-Butyl hydroperoxide 110-83-8, Cyclohexene, reactions **645-49-8**, Z-Stilbene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(pyridines as bifunctional cocatalysts in chromic acid-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)

IT 930-68-7P, 2-Cyclohexen-1-one **1689-71-0P**, Oxirane, 2,3-diphenyl-, cis-
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(pyridines as bifunctional cocatalysts in chromic acid-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)

IT **1333-82-0**, Chromium trioxide
RL: **CAT (Catalyst use)**; USES (Uses)
(pyridines as bifunctional cocatalysts in chromium trioxide-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)

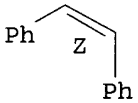
IT **75-91-2**, tert-Butyl hydroperoxide **645-49-8**, Z-Stilbene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(pyridines as bifunctional cocatalysts in chromic acid-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)

RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)

HO—O—Bu-t

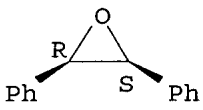
RN 645-49-8 HCAPLUS
CN Benzene, 1,1'-(1Z)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

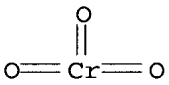


IT **1689-71-0P**, Oxirane, 2,3-diphenyl-, cis-
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(pyridines as bifunctional cocatalysts in chromic acid-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)
RN 1689-71-0 HCAPLUS
CN Oxirane, 2,3-diphenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT **1333-82-0**, Chromium trioxide
RL: **CAT (Catalyst use)**; USES (Uses)
(pyridines as bifunctional cocatalysts in chromium trioxide-catalyzed oxygenation of olefins by tert-Bu hydroperoxide)
RN 1333-82-0 HCAPLUS
CN Chromium oxide (CrO3) (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 15 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1998:157939 HCAPLUS
DOCUMENT NUMBER: 128:192786
TITLE: Metal-Catalyzed Oxidations with Pinane Hydroperoxide: A Mechanistic Probe To Distinguish between Oxometal and Peroxometal Pathways
AUTHOR(S): Lempers, H. E. B.; Ripolles·i Garcia, A.; Sheldon, R. A.
CORPORATE SOURCE: Department of Organic Chemistry and Catalysis, Delft University of Technology, Delft, 2628 BL, Neth.
SOURCE: Journal of Organic Chemistry (1998), 63(5), 1408-1413
CODEN: JOCEAH; ISSN: 0022-3263
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 128:192786
AB The relative reactivities of tert-Bu hydroperoxide (TBHP) and pinane hydroperoxide (PHP) in metal (Cr, Mo, Ru, Se, V, and Zr)-catalyzed oxidns. were compared. When these oxidns. involve rate-limiting oxygen transfer from a peroxometal species to the substrate huge differences between TBHP and PHP were observed, e.g., molybdenum-catalyzed epoxidn. of cyclohexene with TBHP gave a 98% yield while PHP gave 0%. When the reaction involves reaction of an oxometal species with the substrate as the rate-limiting step, little or no difference is observed, e.g., the selenium-catalyzed allylic oxidation of β-pinene gave a 96% and 99% yield with TBHP and

PHP, resp. Small but significant differences are observed when reoxidn. of the catalyst by the hydroperoxide to the active oxometal species is the rate-limiting step; e.g., the chromium-catalyzed oxidation of carveol gave carvone in 89% and 24% yield with TBHP and PHP, resp. Hence, the effect of RO2H structure on rate is dependent on the rate-limiting step.

CC 30-10 (Terpenes and Terpenoids)
Section cross-reference(s): 22

IT **Epoxidation**
Oxidation catalysts
Oxidizing agents
Reaction mechanism
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)

IT 3153-26-2 7446-08-4, Selenium dioxide 10049-08-8, Ruthenium trichloride 13939-06-5, Molybdenum hexacarbonyl 20816-12-0, Osmium tetroxide **21679-31-2**, Chromium acetylacetonate 23519-77-9, Zirconium propoxide
RL: **CAT (Catalyst use)**; USES (Uses)
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)

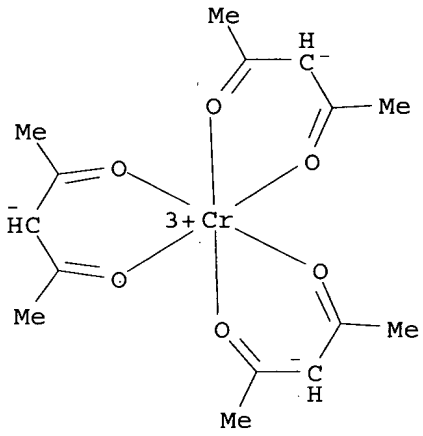
IT **75-91-2**, tert-Butyl hydroperoxide **78-70-6**, Linalool 80-56-8, α-Pinene **98-83-9**, α-Methylstyrene, reactions **106-24-1**, Geraniol **106-25-2**, Nerol **107-18-6**, Allyl alcohol, reactions 110-83-8, Cyclohexene, reactions 127-91-3, β-Pinene **138-86-3**, Limonene **504-61-0**, trans-Crotyl alcohol 515-00-4, Myrtenol 554-61-0, 2-Carene **556-82-1**, Prenol **816-79-5**, 3-Ethyl-2-pentene 822-67-3, 2-Cyclohexen-1-ol **1197-06-4**, cis-Carveol **1197-07-5**, trans-Carveol 1490-04-6, Menthol 1686-14-2, α-Pinene oxide **15918-08-8**, 2-Propyl-1-pentene **28324-52-9**, Pinane hydroperoxide 57650-65-4, Methylenecyclohexene 93133-02-9, Sobrerol 8-acetate
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)

IT **99-49-0P**, Carvone 5947-36-4P, Pinocarveol 53404-49-2P, Pinane-2,3-diol
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)

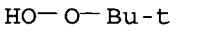
IT 89-80-5P, Menthone 141-27-5P, Geranial 286-20-4P, Cyclohexene oxide **556-52-5P**, Glycidol 931-17-9P, Cyclohexane-1,2-diol 1192-78-5P, 2,3-Epoxycyclohexanol 1195-92-2P, 2,3-Epoxy-p-menth-8-ene 4065-80-9P, 2-Methylenecyclohexanol 4217-66-7P, 2-Phenylpropane-1,2-diol 6006-81-1P, 2-Phenylallyl alcohol **15249-34-0P**, Linalool 1,2-epoxide **18511-56-3P**, 3,3-Dimethyloxirane-2-methanol **22520-28-1P**, trans-3-Methyloxirane-2-methanol **62960-04-7P**, Geraniol 2,3-epoxide **71030-55-2P**, Nerol 2,3-epoxide 79951-98-7P, Pinocarveol epoxide 104320-46-9P, Myrtenol epoxide 202921-46-8P 202921-48-0P, 8-Hydroxy-2-carene 202921-49-1P, 2-Propyl-1-penten-3-ol 202921-51-5P, 3-Ethyl-3-penten-2-ol 203065-76-3P 203065-77-4P, trans-Carveol 1,6-epoxide
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)

IT **21679-31-2**, Chromium acetylacetonate
RL: **CAT (Catalyst use)**; USES (Uses)
(mechanistic study of metal-catalyzed oxidns. with pinane

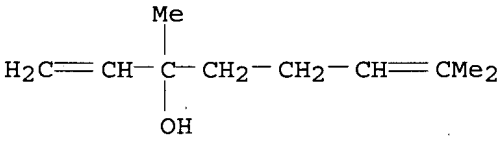
hydroperoxide)
RN 21679-31-2 HCAPLUS
CN Chromium, tris(2,4-pentanedionato-κO,κO')-, (OC-6-11)- (9CI) (CA INDEX NAME)



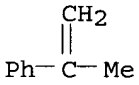
IT **75-91-2**, tert-Butyl hydroperoxide **78-70-6**, Linalool **98-83-9**, α-Methylstyrene, reactions **106-24-1**, Geraniol **106-25-2**, Nerol **107-18-6**, Allyl alcohol, reactions **138-86-3**, Limonene **504-61-0**, trans-Crotyl alcohol **556-82-1**, Prenol **816-79-5**, 3-Ethyl-2-pentene **1197-06-4**, cis-Carveol **1197-07-5**, trans-Carveol **15918-08-8**, 2-Propyl-1-pentene **28324-52-9**, Pinane hydroperoxide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 78-70-6 HCAPLUS
CN 1,6-Octadien-3-ol, 3,7-dimethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)

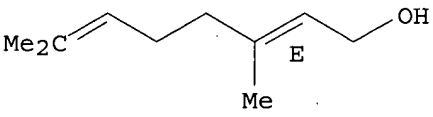


RN 98-83-9 HCAPLUS
CN Benzene, (1-methylethenyl)- (9CI) (CA INDEX NAME)



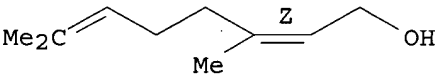
RN 106-24-1 HCAPLUS
CN 2,6-Octadien-1-ol, 3,7-dimethyl-, (2E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

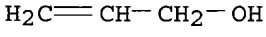


RN 106-25-2 HCAPLUS
CN 2,6-Octadien-1-ol, 3,7-dimethyl-, (2Z)- (9CI) (CA INDEX NAME)

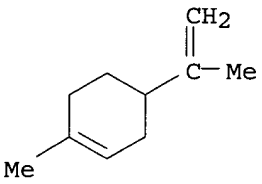
Double bond geometry as shown.



RN 107-18-6 HCAPLUS
CN 2-Propen-1-ol (9CI) (CA INDEX NAME)

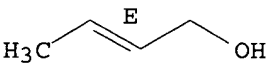


RN 138-86-3 HCAPLUS
CN Cyclohexene, 1-methyl-4-(1-methylethenyl)- (9CI) (CA INDEX NAME)

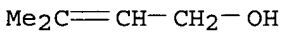


RN 504-61-0 HCAPLUS
CN 2-Buten-1-ol, (2E)- (9CI) (CA INDEX NAME)

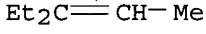
Double bond geometry as shown.



RN 556-82-1 HCAPLUS
CN 2-Buten-1-ol, 3-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)

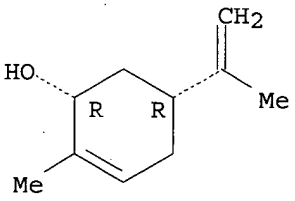


RN 816-79-5 HCAPLUS
CN 2-Pentene, 3-ethyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



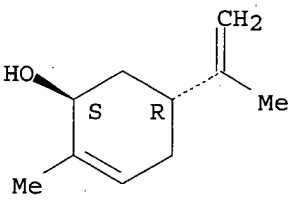
RN 1197-06-4 HCAPLUS
CN 2-Cyclohexen-1-ol, 2-methyl-5-(1-methylethenyl)-, (1R,5R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.

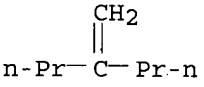


RN 1197-07-5 HCAPLUS
CN 2-Cyclohexen-1-ol, 2-methyl-5-(1-methylethenyl)-, (1R,5S)-rel- (9CI) (CA INDEX NAME)

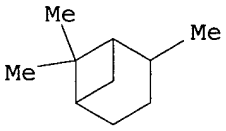
Relative stereochemistry.

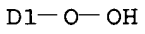


RN 15918-08-8 HCAPLUS
CN Heptane, 4-methylene- (9CI) (CA INDEX NAME)

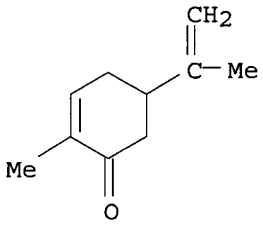


RN 28324-52-9 HCAPLUS
CN Hydroperoxide, 2,6,6-trimethylbicyclo[3.1.1]heptyl (9CI) (CA INDEX NAME)

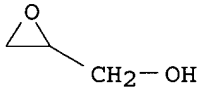




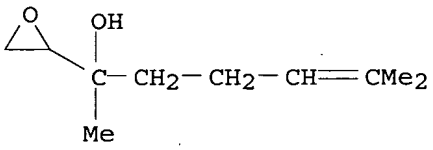
IT **99-49-0P**, Carvone
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)
RN 99-49-0 HCAPLUS
CN 2-Cyclohexen-1-one, 2-methyl-5-(1-methylethenyl)- (9CI) (CA INDEX NAME)



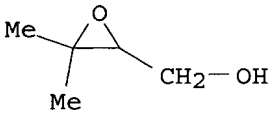
IT **556-52-5P**, Glycidol **15249-34-0P**, Linalool 1,2-epoxide **18511-56-3P**, 3,3-Dimethyloxirane-2-methanol **22520-28-1P**, trans-3-Methyloxirane-2-methanol **62960-04-7P**, Geraniol 2,3-epoxide **71030-55-2P**, Nerol 2,3-epoxide
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(mechanistic study of metal-catalyzed oxidns. with pinane hydroperoxide)
RN 556-52-5 HCAPLUS
CN Oxiranemethanol (9CI) (CA INDEX NAME)



RN 15249-34-0 HCAPLUS
CN Oxiranemethanol, α-methyl-α-(4-methyl-3-pentenyl)- (9CI) (CA INDEX NAME)

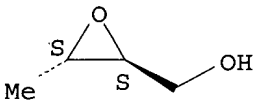


RN 18511-56-3 HCAPLUS
CN Oxiranemethanol, 3,3-dimethyl- (9CI) (CA INDEX NAME)



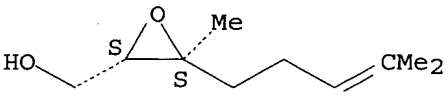
RN 22520-28-1 HCAPLUS
CN Oxiranemethanol, 3-methyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



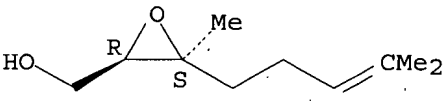
RN 62960-04-7 HCAPLUS
CN Oxiranemethanol, 3-methyl-3-(4-methyl-3-pentenyl)-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 71030-55-2 HCAPLUS
CN Oxiranemethanol, 3-methyl-3-(4-methyl-3-pentenyl)-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



REFERENCE COUNT: 73 THERE ARE 73 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 16 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1996:607605 HCAPLUS
DOCUMENT NUMBER: 125:247604
TITLE: Integrated process and catalysts for epoxidation
INVENTOR(S): Crocco, Guy L.; Jubin, John C., Jr.; Zajacek, John G.
PATENT ASSIGNEE(S): Arco Chemical Technology, L.P., USA
SOURCE: Eur. Pat. Appl., 10 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

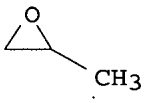
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 732327	A1	19960918	EP 1996-301645	19960311
EP 732327	B1	19990506		
R: AT, BE, DE, ES, FR, GB, IT, NL				
US 5693834	A	19971202	US 1995-404657	19950315
IN 187024	A	20011229	IN 1996-CA335	19960226
CA 2170557	AA	19960916	CA 1996-2170557	19960228
JP 08245604	A2	19960924	JP 1996-68912	19960301
AT 179705	E	19990515	AT 1996-301645	19960311
ES 2133898	T3	19990916	ES 1996-301645	19960311
RU 2168504	C2	20010610	RU 1996-104554	19960314
CN 1138039	A	19961218	CN 1996-103129	19960315
PRIORITY APPLN. INFO.:			US 1995-404657 A	19950315

AB Epoxides are produced by an integrated process involving the mol. oxygen oxidation of a secondary alc., separation of the ketone coproduct, and epoxidn. of an olefin using the ketone-free oxidation product in the presence of a Ti silicalite catalyst and a methanol-containing diluent, where the methanol recovered from the epoxidn. product mixture serves as a source of methanol in the epoxidn. step.
IC ICM C07D301-12
ICS C07D303-04
CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 35, 45, 48, 67
IT **Epoxidation**
(integrated process for epoxidn.)
IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(integrated process and catalysts for epoxidn.)
IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(integrated process and catalysts for epoxidn.)
IT 67-63-0, Isopropanol, reactions **115-07-1**, Propylene, reactions **7722-84-1**, Hydrogen peroxide, reactions 7782-44-7, Oxygen, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(integrated process and catalysts for epoxidn.)
IT **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(integrated process and catalysts for epoxidn.)
RN 7440-47-3 HCAPLUS

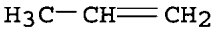
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

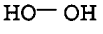
IT **75-56-9P**, Propylene oxide, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(integrated process and catalysts for epoxidn.)
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



IT **115-07-1**, Propylene, reactions **7722-84-1**, Hydrogen peroxide, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(integrated process and catalysts for epoxidn.)
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)

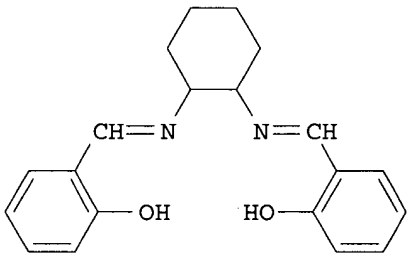


L49 ANSWER 17 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1996:596108 HCAPLUS
DOCUMENT NUMBER: 125:236922
TITLE: Process for preparation of transition metal salicylaldimine complexes and their use in epoxidation and oxidation
INVENTOR(S): Declan, Gilheany; Ryan, Kenneth; Dalton, Cormac; Langan, Ivan; Wall, Valine; Corr, David; Coyne, Eamonn; Furlong, Patrick; Bousquet, Claudine
PATENT ASSIGNEE(S): University College Dublin, Ire.
SOURCE: PCT Int. Appl., 52 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9624601	A1	19960815	WO 1996-IE5	19960212
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG				
RW: KP, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG				
AU 9646745	A1	19960827	AU 1996-46745	19960212
PRIORITY APPLN. INFO.:			IE 1995-111	A 19950210
			WO 1996-IE5	W 19960212

OTHER SOURCE(S): MARPAT 125:236922

GI



I

AB HL and chiral nonracemic [MLQ]X and [MOLQ]X (M = transition metal; tetradentate or quinquedentatate H2L = R,R- and S,S-I and their derivs. and related ligands; Q = neutral donor ligand; X = nonnucleophilic anion) were prepared, in which Q is optically present. [MOLQ]X are useful for stereoselectively epoxidizing an alkene and for stereoselectively oxidizing a a tertiary amine, an organic sulfide or a racemic tertiary phosphine.

IC C07F011-00; C07F015-00; C07F007-00; C07F009-00; C07C251-00

CC 78-7 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 21, 25, 29

IT **Epoxidation catalysts**
(stereoselective, transition metal Schiff base oxo complexes with neutral donor ligands for alkenes)

IT **98-83-9**, reactions **100-42-5**, reactions **103-30-0**, trans-Stilbene **104-46-1**, Anethole 447-53-0, 1,2-Dihydronaphthalene **766-90-5**, Z-β-Methylstyrene **873-66-5 13269-52-8**, trans-3-Hexene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(catalytic epoxidn. in presence of chromium Schiff base complexes)

IT 67-64-1DP, 2-Propanone, transition metal Schiff base oxo complexes 67-68-5DP, DMSO, transition metal Schiff base oxo complexes 68-12-2DP, DMF, transition metal Schiff base oxo complexes 78-40-0DP, Triethyl phosphate, transition metal Schiff base oxo complexes 78-42-2DP, Tris(2-ethylhexyl) phosphate, transition metal Schiff base oxo complexes 78-50-2DP, Trioctylphosphine oxide, transition metal Schiff base oxo complexes 91-20-3DP, Naphthalene, transition metal Schiff base oxo complexes 694-59-7DP, Pyridine oxide, transition metal Schiff base oxo complexes 791-28-6DP, Triphenylphosphine oxide, transition metal Schiff base oxo complexes 814-29-9DP, Tributylphosphine oxide, transition metal Schiff base oxo complexes 931-19-1DP, transition metal Schiff base oxo complexes 1003-73-2DP, transition metal Schiff base oxo complexes 1131-61-9DP, 4-Phenylpyridine oxide, transition metal Schiff base oxo

complexes 1330-78-5DP, Tritolyl phosphate, transition metal Schiff base oxo complexes 2528-39-4DP, Trihexyl phosphate, transition metal Schiff base oxo complexes **7440-47-3DP**, Chromium, Schiff base complexes with neutral donor ligands 10025-87-3DP, Trichlorophosphine oxide, transition metal Schiff base oxo complexes 23897-17-8DP, Trimesitylphosphine oxide, transition metal Schiff base oxo complexes 26756-22-9DP, Benzyl-tert-butyl sulfoxide, transition metal Schiff base oxo complexes 181653-66-7DP, transition metal Schiff base oxo complexes 181658-21-9DP, transition metal Schiff base oxo complexes
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and epoxidn. catalyst for alkenes)

IT **181652-11-9P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and use and epoxidn. for alkenes)

IT **171199-55-6P 171199-57-8P 171199-85-2P**
181652-03-9P 181652-05-1P 181652-07-3P
181652-09-5P 181652-13-1P 181652-15-3P
181652-17-5P 181652-19-7P 181652-21-1P
181652-23-3P 181652-25-5P 181652-27-7P
181652-29-9P 181652-31-3P 181652-33-5P
181652-35-7P 181652-37-9P 181652-39-1P
181652-41-5P 181652-43-7P 181652-45-9P
181652-47-1P 181652-49-3P 181652-51-7P
181652-53-9P 181652-55-1P 181652-57-3P
181652-59-5P 181652-61-9P 181652-63-1P
181652-65-3P 181652-67-5P 181652-69-7P
181652-71-1P 181652-73-3P 181652-75-5P
181652-77-7P 181652-79-9P 181652-82-4P
181652-84-6P 181652-86-8P 181652-88-0P
181652-90-4P 181652-92-6P 181652-94-8P
181652-96-0P 181652-98-2P 181653-01-0P
181653-03-2P 181653-05-4P 181653-07-6P
181653-09-8P 181653-11-2P 181653-13-4P
181653-15-6P 181653-17-8P 181653-20-3P
181653-22-5P 181653-24-7P 181653-27-0P
181653-31-6P 181653-33-8P 181653-35-0P
181653-37-2P 181653-39-4P 181653-41-8P
181653-43-0P 181653-45-2P 181653-47-4P
181653-49-6P 181653-51-0P 181653-53-2P
181653-65-6P 181653-68-9P 181787-66-6P
181787-68-8P 181787-70-2P 181787-72-4P
181787-74-6P 181787-76-8P 181787-78-0P
181787-80-4P 181787-82-6P 181787-84-8P
181787-86-0P
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and use as epoxidn. catalysts for alkenes)

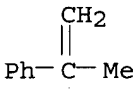
IT **96-09-3P**, Phenyl oxirane **2085-88-3P 4518-66-5P**
14212-53-4P 14212-54-5P 17619-97-5P
27415-21-0P 51410-46-9P
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation by catalytic epoxidn. of alkene in presence of chromium Schiff base complexes)

IT 110-86-1, Pyridine, reactions 536-80-1, Iodosylbenzene **937-14-4**, m-Chloroperbenzoic acid 7529-22-8, N-Methylmorpholine oxide 7601-89-0, Sodium perchlorate 7782-44-7, Oxygen, reactions 7790-28-5, Sodium periodate 10028-15-6, Ozone, reactions 13477-00-4, Barium

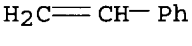
chlorate 14433-93-3, Iron(3+) hexacyanoferrate(3-) 14460-01-6, TriIron(2+) bis(hexacyanoferrate(3-)) 33497-30-2, Sodium perbromate
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(reactant for catalytic epoxidn. of alkenes in presence of transition metal Schiff base complexes with neutral donor ligands)

IT **98-83-9**, reactions **100-42-5**, reactions **103-30-0**, trans-Stilbene **104-46-1**, Anethole **766-90-5**, Z-β-Methylstyrene **873-66-5 13269-52-8**, trans-3-Hexene
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(catalytic epoxidn. in presence of chromium Schiff base complexes)

RN 98-83-9 HCAPLUS
CN Benzene, (1-methylethenyl)- (9CI) (CA INDEX NAME)

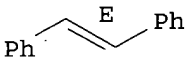


RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)

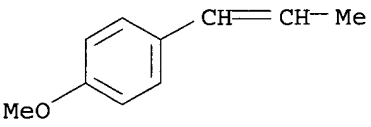


RN 103-30-0 HCAPLUS
CN Benzene, 1,1'-(1E)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

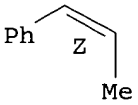


RN 104-46-1 HCAPLUS
CN Benzene, 1-methoxy-4-(1-propenyl)- (9CI) (CA INDEX NAME)



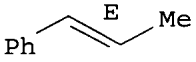
RN 766-90-5 HCAPLUS
CN Benzene, (1Z)-1-propenyl- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



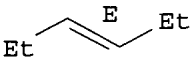
RN 873-66-5 HCAPLUS
CN Benzene, (1E)-1-propenyl- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



RN 13269-52-8 HCAPLUS
CN 3-Hexene, (3E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT **7440-47-3DP**, Chromium, Schiff base complexes with neutral donor ligands
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and epoxidn. catalyst for alkenes)
RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

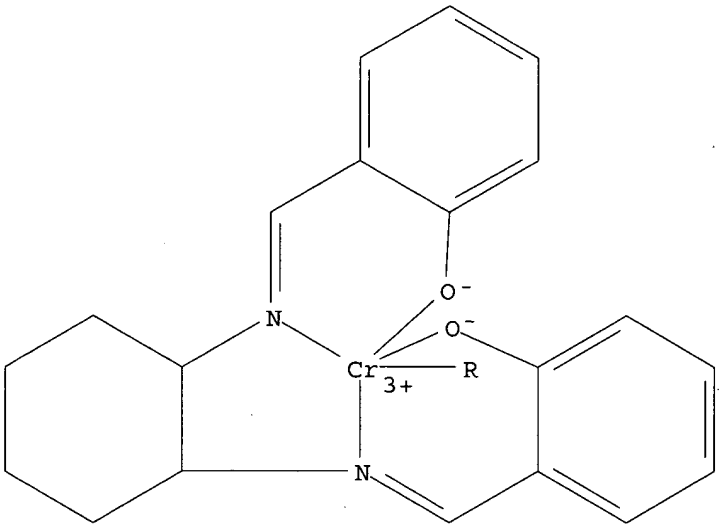
Cr

IT **181652-11-9P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and use and epoxidn. for alkenes)
RN 181652-11-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][1-methoxy-4-[(4-methylphenyl)sulfinyl]benzene-O4]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

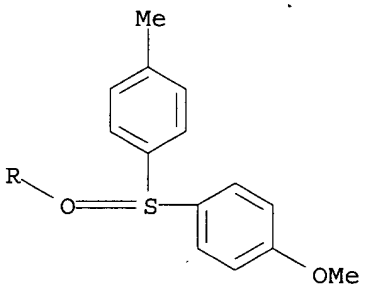
CM 1

CRN 181652-10-8
CMF C34 H34 Cr N2 O4 S
CCI CCS

PAGE 1-A

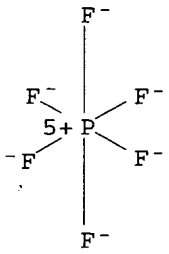


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



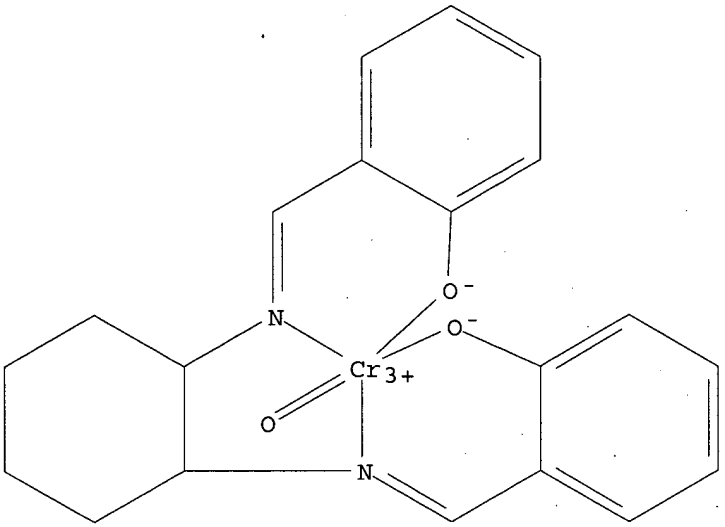
IT **171199-55-6P 171199-57-8P 171199-85-2P**
181652-03-9P 181652-05-1P 181652-07-3P
181652-09-5P 181652-13-1P 181652-15-3P
181652-17-5P 181652-19-7P 181652-21-1P
181652-23-3P 181652-25-5P 181652-27-7P
181652-29-9P 181652-31-3P 181652-33-5P
181652-35-7P 181652-37-9P 181652-39-1P
181652-41-5P 181652-43-7P 181652-45-9P
181652-47-1P 181652-49-3P 181652-51-7P
181652-53-9P 181652-55-1P 181652-57-3P
181652-59-5P 181652-61-9P 181652-63-1P
181652-65-3P 181652-67-5P 181652-69-7P
181652-71-1P 181652-73-3P 181652-75-5P
181652-77-7P 181652-79-9P 181652-82-4P
181652-84-6P 181652-86-8P 181652-88-0P
181652-90-4P 181652-92-6P 181652-94-8P
181652-96-0P 181652-98-2P 181653-01-0P
181653-03-2P 181653-05-4P 181653-07-6P
181653-09-8P 181653-11-2P 181653-13-4P
181653-15-6P 181653-17-8P 181653-20-3P
181653-22-5P 181653-24-7P 181653-27-0P
181653-31-6P 181653-33-8P 181653-35-0P
181653-37-2P 181653-39-4P 181653-41-8P
181653-43-0P 181653-45-2P 181653-47-4P
181653-49-6P 181653-51-0P 181653-53-2P
181653-65-6P 181653-68-9P 181787-66-6P
181787-68-8P 181787-70-2P 181787-72-4P
181787-74-6P 181787-76-8P 181787-78-0P
181787-80-4P 181787-82-6P 181787-84-8P
181787-86-0P
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and use as epoxidn. catalysts for alkenes)

RN 171199-55-6 HCAPLUS

CN Chromium(1+), [[2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(nitrilo-κN)methylidyne]]bis[phenolato-κO]](2-)]oxo-, (SP-5-23)-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

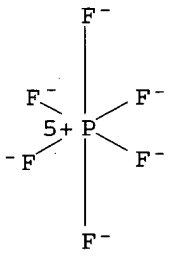
CM 1

CRN 171199-54-5
CMF C20 H20 Cr N2 O3
CCI CCS



CM 2

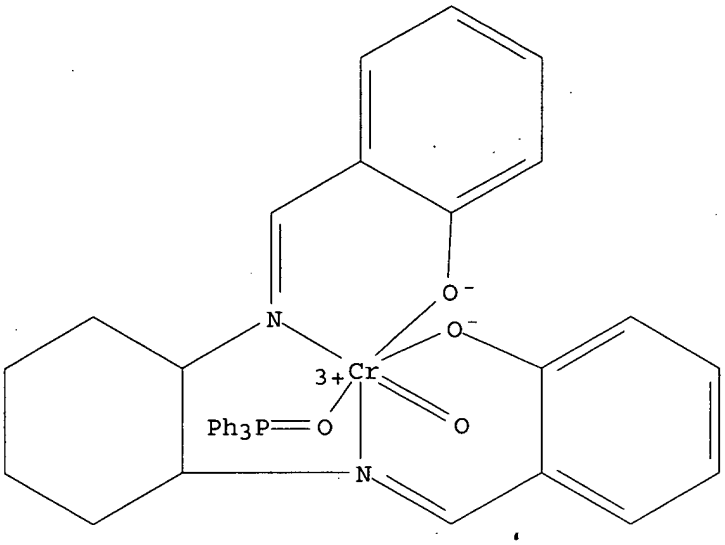
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 171199-57-8 HCAPLUS
CN Chromium(1+), [[2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(nitrilo-κN)methylidyne]]bis[phenolato-κO]](2-)]oxo(triphenylphosphine oxide-κO)-, (OC-6-34)-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

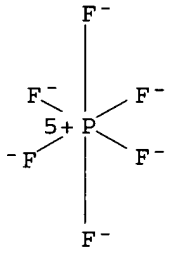
CM 1

CRN 171199-56-7
CMF C38 H35 Cr N2 O4 P
CCI CCS



CM 2

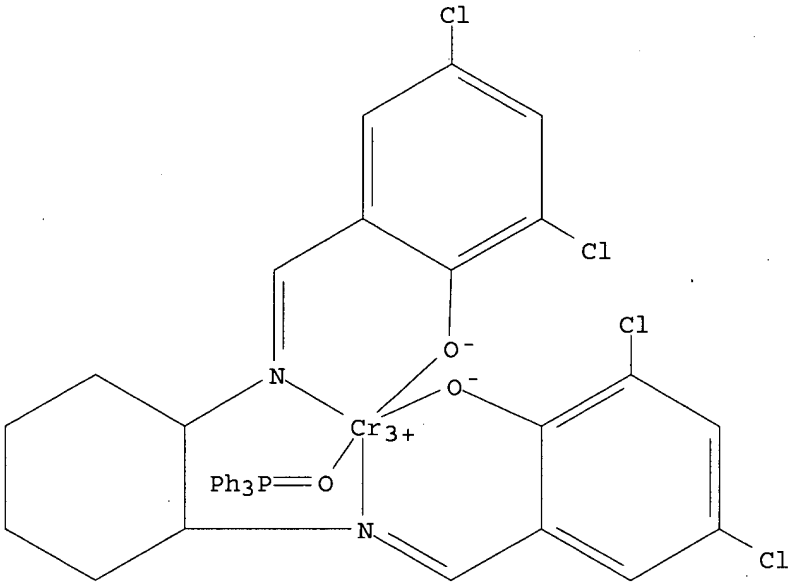
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 171199-85-2 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4,6-dichlorophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

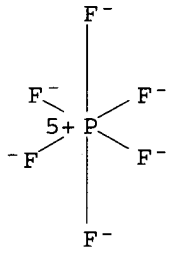
CM 1

CRN 171199-84-1
CMF C38 H31 Cl4 Cr N2 O3 P
CCI CCS



CM 2

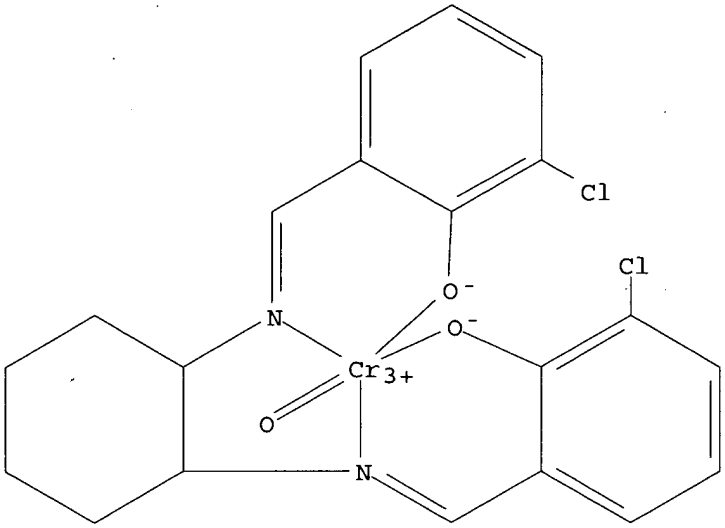
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-03-9 HCAPLUS
CN Chromium(1+), [[2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(nitrilo-κN)methylidyne]]bis[6-chlorophenolato-κO]](2-)]oxo-, (SP-5-23)-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

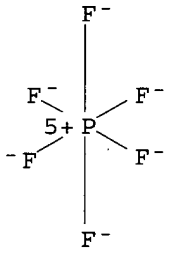
CM 1

CRN 181652-02-8
CMF C20 H18 Cl2 Cr N2 O3
CCI CCS



CM 2

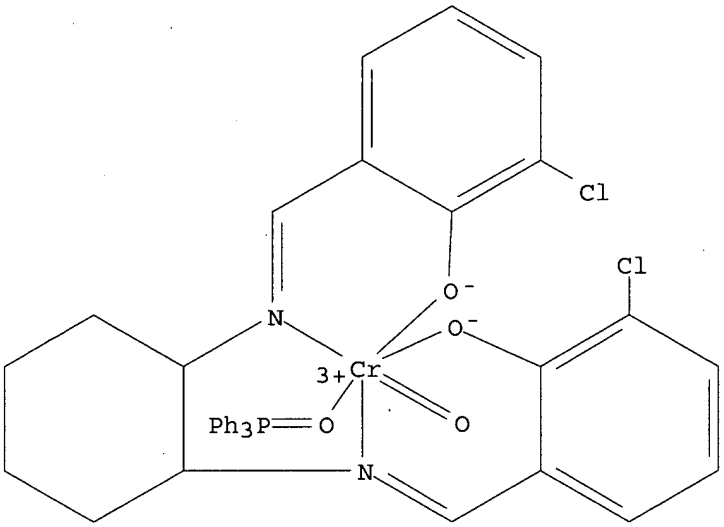
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-05-1 HCAPLUS
CN Chromium(1+), [[2,2'-[(1R,2R)-1,2-cyclohexanediylbis[(nitrilo-κN)methylidyne]]bis[6-chlorophenolato-κO]](2-)]oxo(triphenylphosphine oxide-κO)-, (OC-6-34)-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

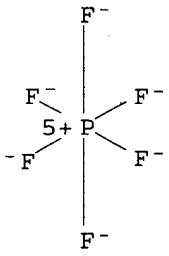
CM 1

CRN 181652-04-0
CMF C38 H33 Cl2 Cr N2 O4 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

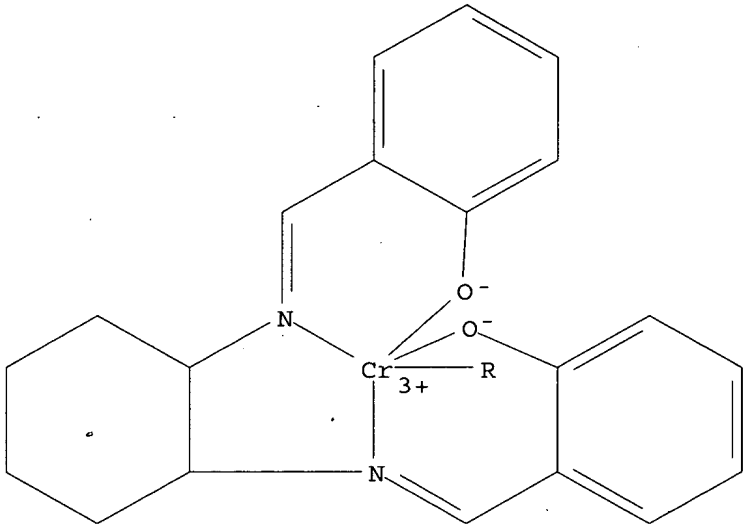


RN 181652-07-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](methyl-1-naphthalenylphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

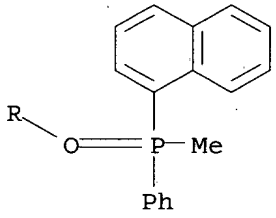
CM 1

CRN 181652-06-2
CMF C37 H35 Cr N2 O3 P
CCI CCS

PAGE 1-A

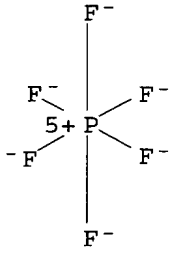


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



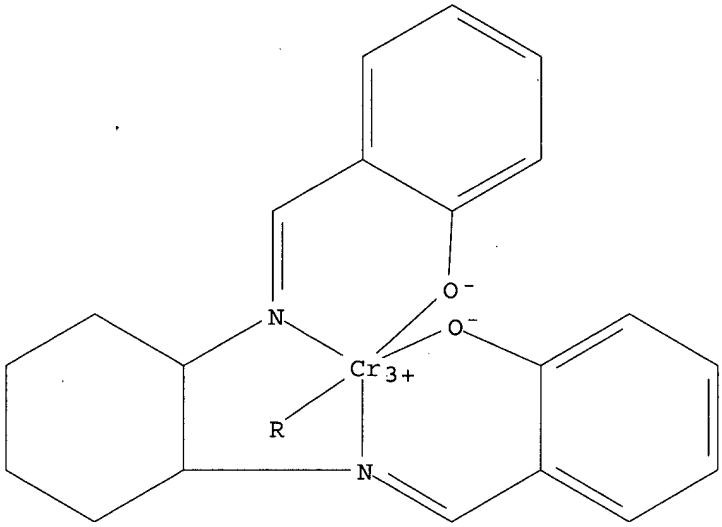
RN 181652-09-5 HCAPLUS

CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][[[(1,1-dimethylethyl)sulfinyl]methyl]benzene-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

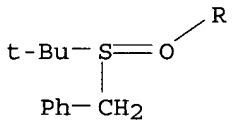
CM 1

CRN 181652-08-4
CMF C31 H36 Cr N2 O3 S
CCI CCS

PAGE 1-A

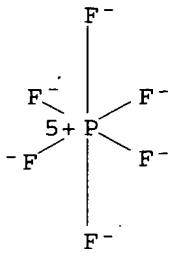


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

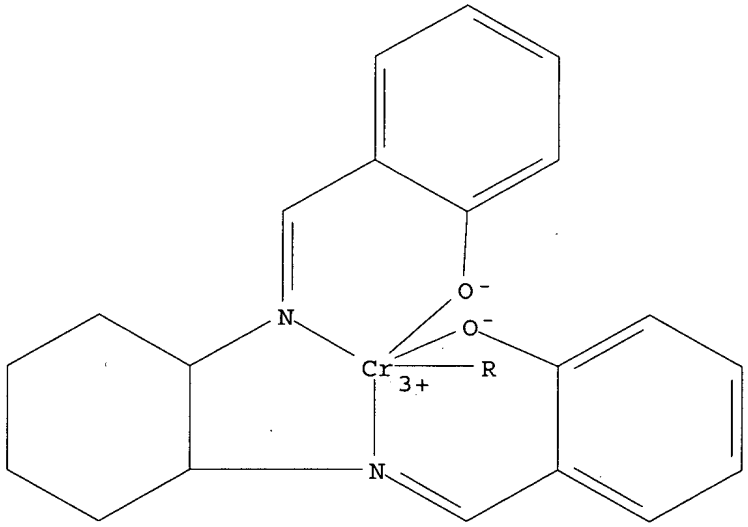


RN 181652-13-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](3-methylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

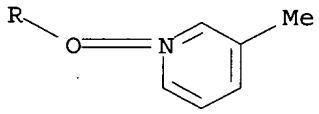
CM 1

CRN 181652-12-0
CMF C26 H27 Cr N3 O3
CCI CCS

PAGE 1-A

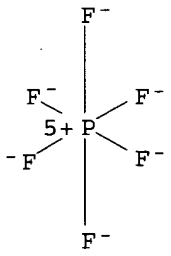


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

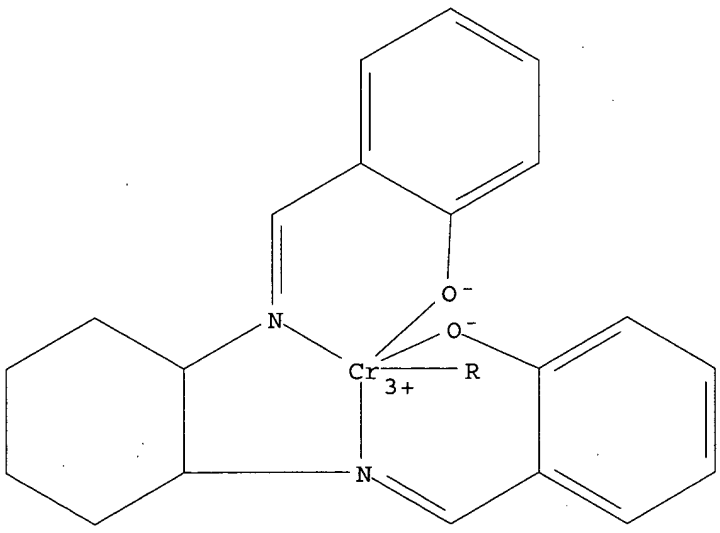


RN 181652-15-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][(4-methoxyphenyl)methylphenylphosphine oxide]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

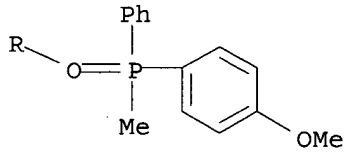
CM 1

CRN 181652-14-2
CMF C34 H35 Cr N2 O4 P
CCI CCS

PAGE 1-A

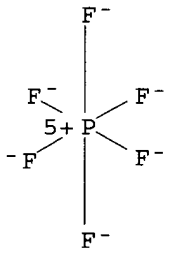


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

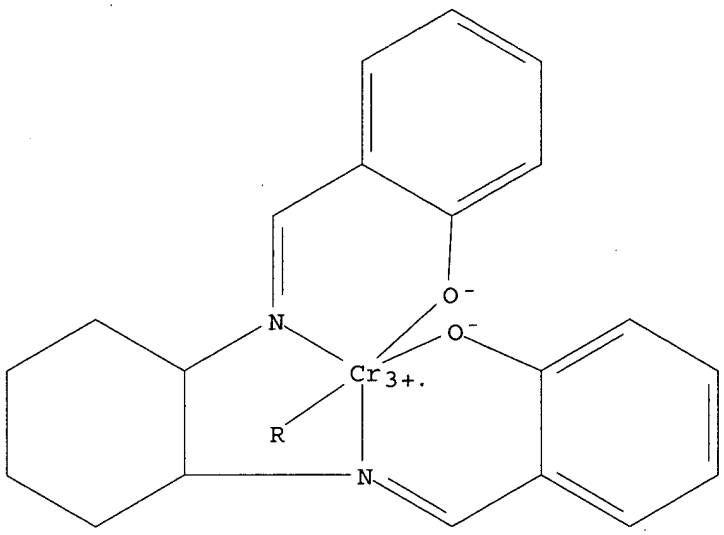


RN 181652-17-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

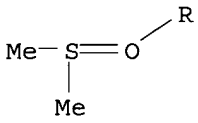
CM 1

CRN 181652-16-4
CMF C22 H26 Cr N2 O3 S
CCI CCS

PAGE 1-A

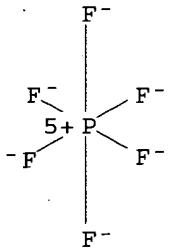


PAGE 2-A



CM 2

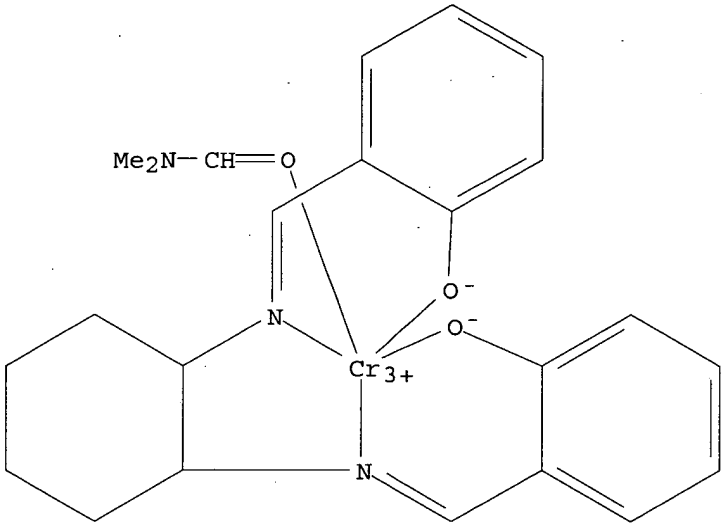
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-19-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

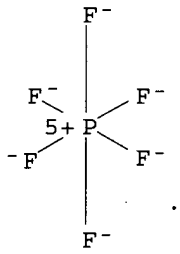
CM 1

CRN 181652-18-6
CMF C23 H27 Cr N3 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



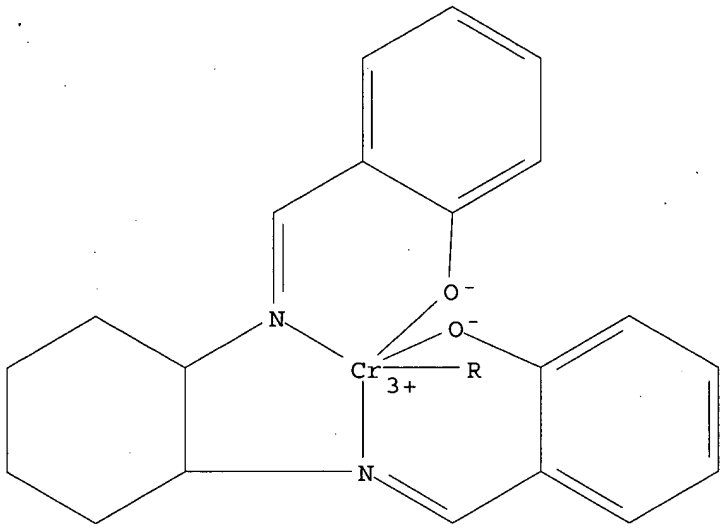
RN 181652-21-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](pyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

CM 1

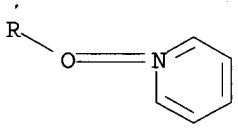
CRN 181652-20-0
CMF C25 H25 Cr N3 O3

CCI CCS

PAGE 1-A

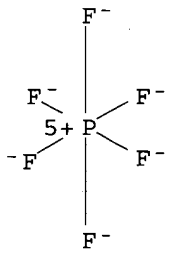


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



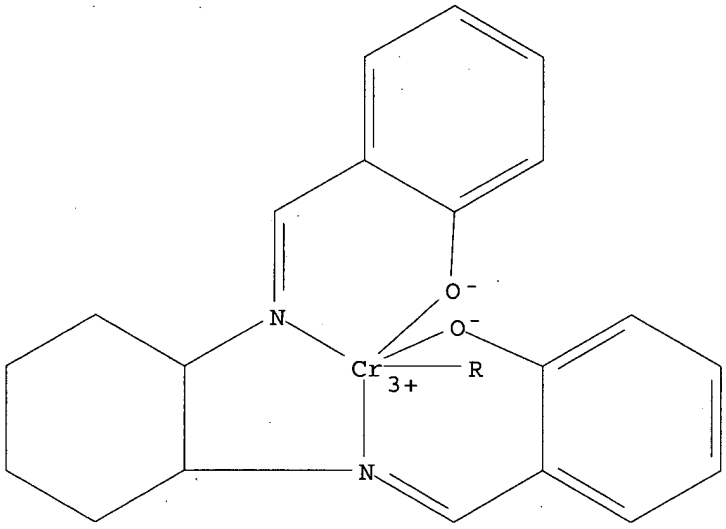
RN 181652-23-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](2-methylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-,

hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

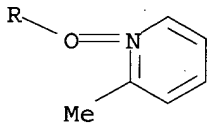
CM 1

CRN 181652-22-2
CMF C26 H27 Cr N3 O3
CCI CCS

PAGE 1-A

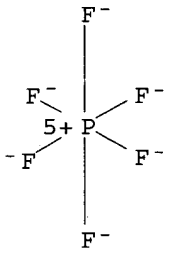


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

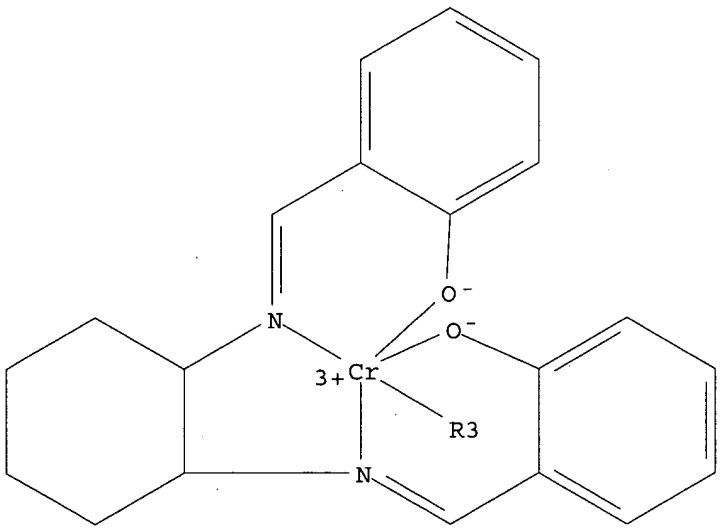


RN 181652-25-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][tris(2,4,6-trimethylphenyl)phosphine oxide-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

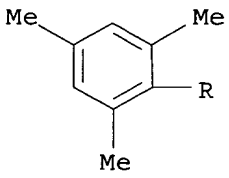
CM 1

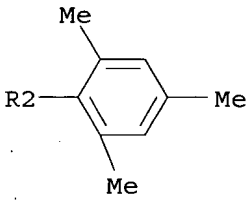
CRN 181652-24-4
CMF C47 H53 Cr N2 O3 P
CCI CCS

PAGE 1-A

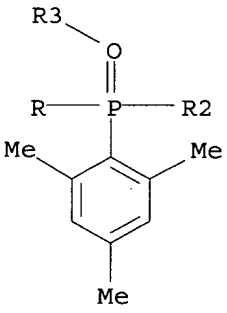


PAGE 2-A



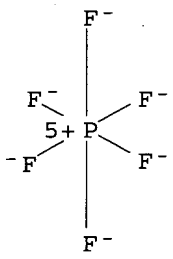


PAGE 3-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

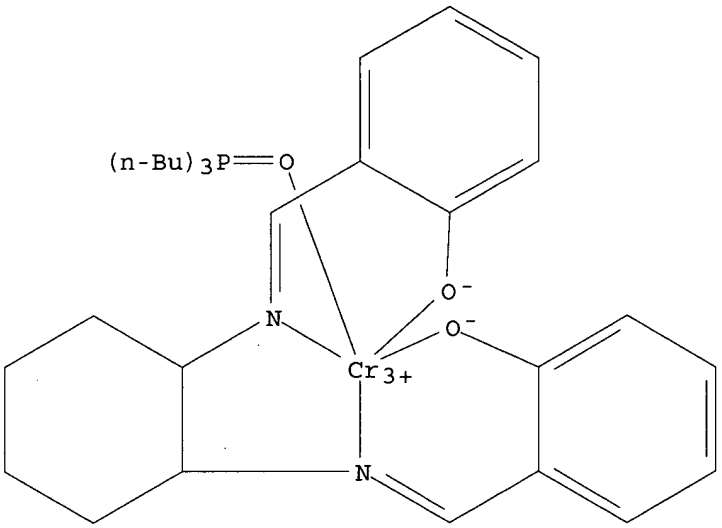


RN 181652-27-7 HCAPLUS

CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](tributylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

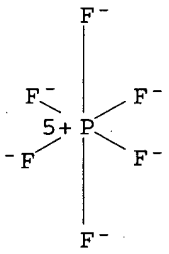
CM 1

CRN 181652-26-6
CMF C32 H47 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

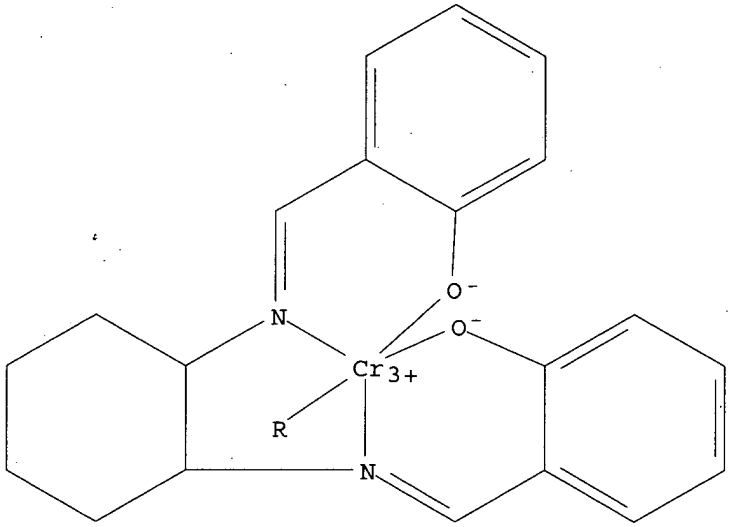


RN 181652-29-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](trioctylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

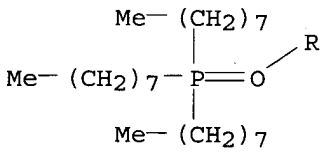
CM 1

CRN 181652-28-8
CMF C44 H71 Cr N2 O3 P
CCI CCS

PAGE 1-A

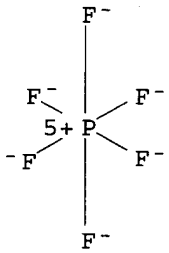


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

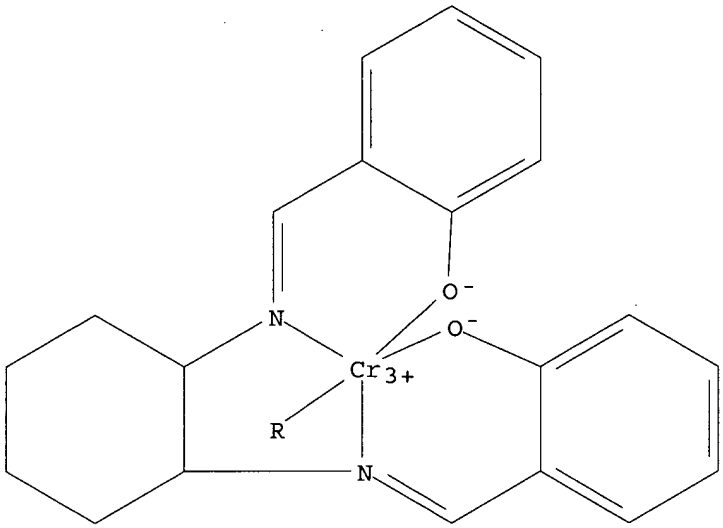


RN 181652-31-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](trihexyl phosphate-O''')-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

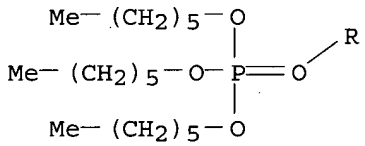
CM 1

CRN 181652-30-2
CMF C38 H59 Cr N2 O6 P
CCI CCS

PAGE 1-A

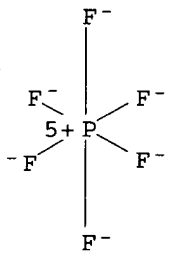


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

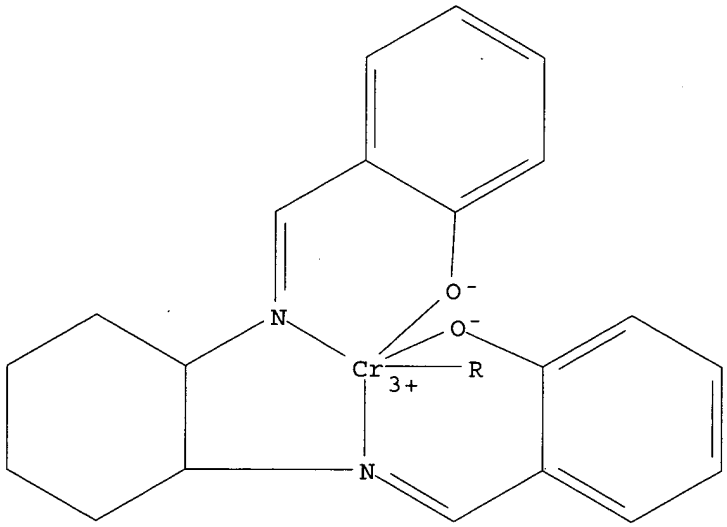


RN 181652-33-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][tris(4-methylphenyl) phosphate-O''']-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

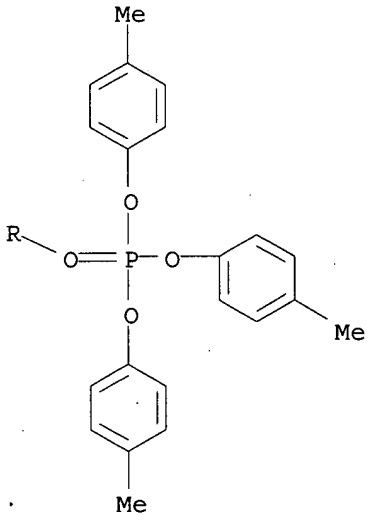
CM 1

CRN 181652-32-4
CMF C41 H41 Cr N2 O6 P
CCI CCS

PAGE 1-A

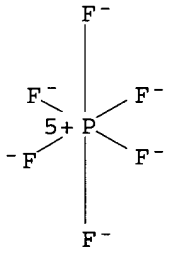


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

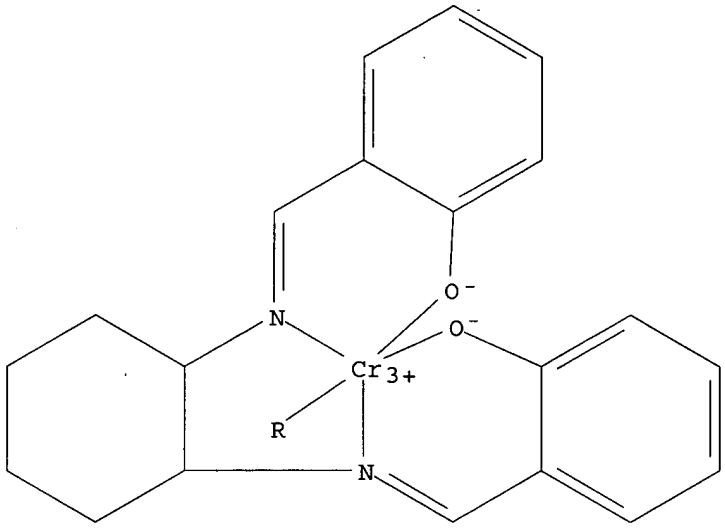


RN 181652-35-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][tris(2-ethylhexyl) phosphate-O''']-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

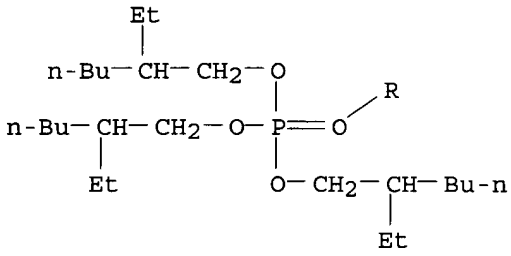
CM 1

CRN 181652-34-6
CMF C44 H71 Cr N2 O6 P
CCI CCS

PAGE 1-A

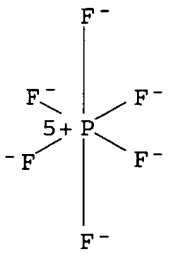


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

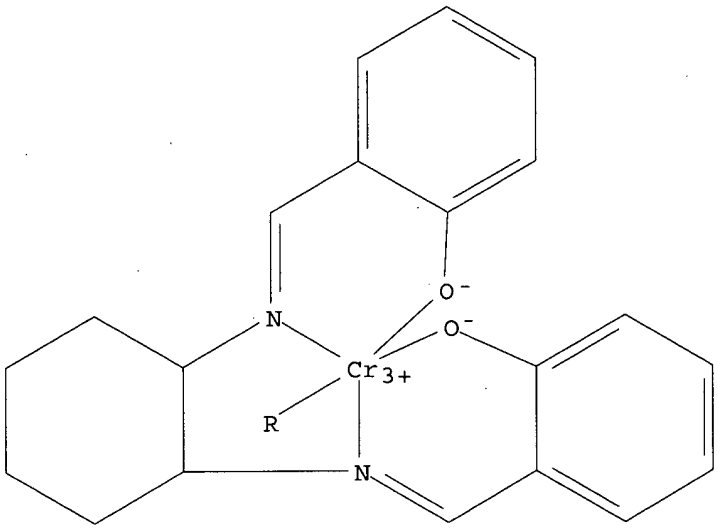


RN 181652-37-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](triethyl phosphate-O''')-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

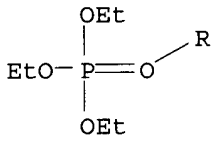
CM 1

CRN 181652-36-8
CMF C26 H35 Cr N2 O6 P
CCI CCS

PAGE 1-A

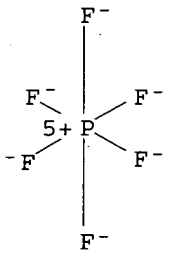


PAGE 2-A



CM 2

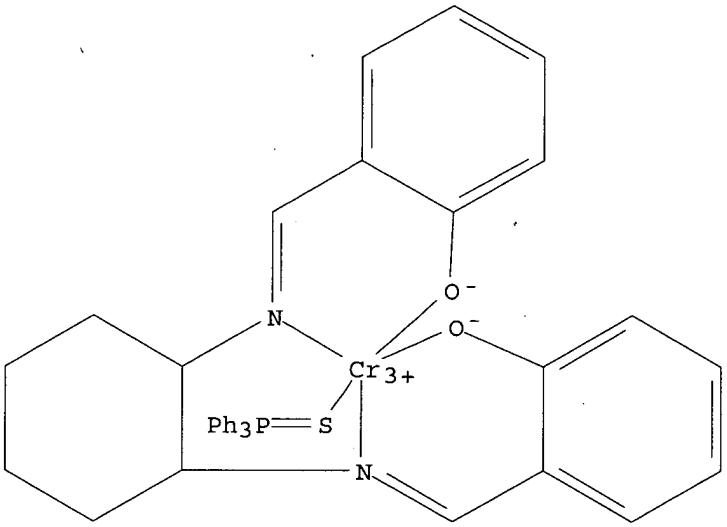
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-39-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](triphenylphosphine sulfide-S)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

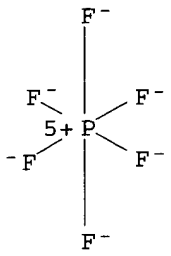
CM 1

CRN 181652-38-0
CMF C38 H35 Cr N2 O2 P S
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

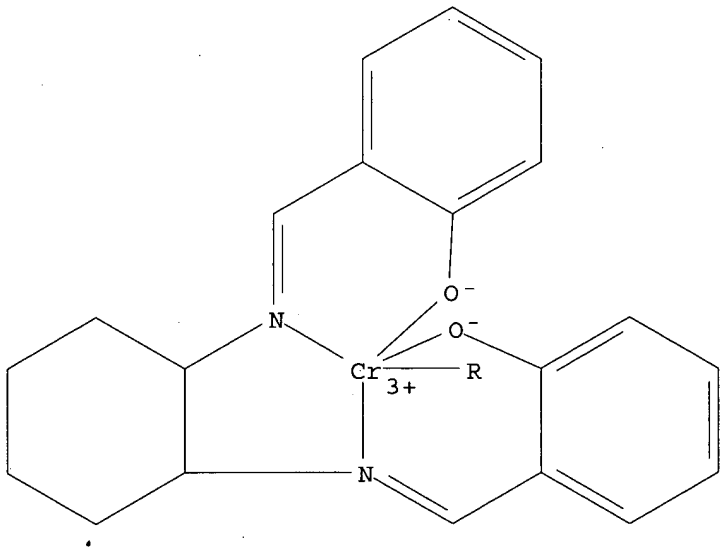


RN 181652-41-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][(4-methoxyphenyl)methylphenylphosphine sulfide-S]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

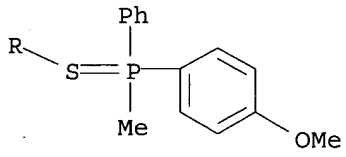
CM 1

CRN 181652-40-4
CMF C34 H35 Cr N2 O3 P S
CCI CCS

PAGE 1-A

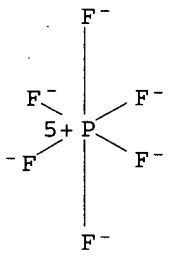


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

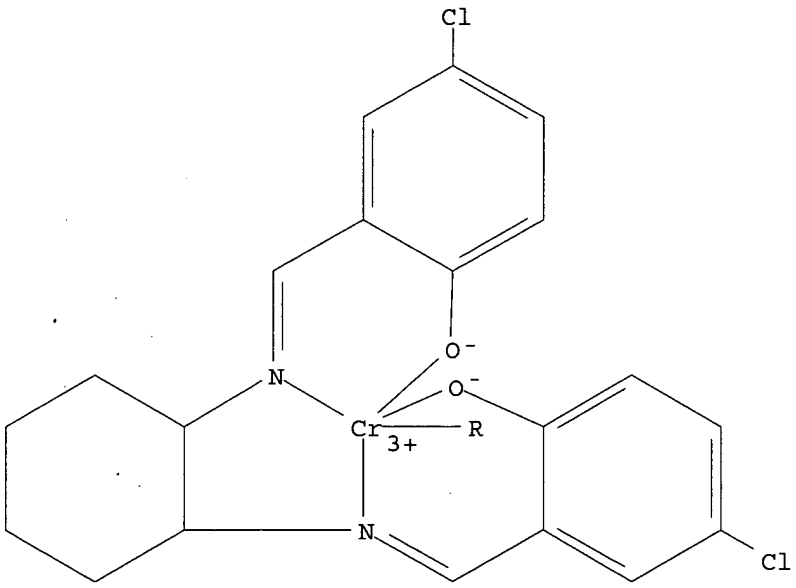


RN 181652-43-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][(4-methoxyphenyl)methylphenylphosphine oxide]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

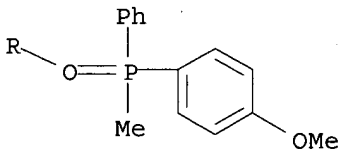
CM 1

CRN 181652-42-6
CMF C34 H33 Cl2 Cr N2 O4 P
CCI CCS

PAGE 1-A

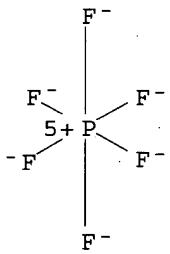


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

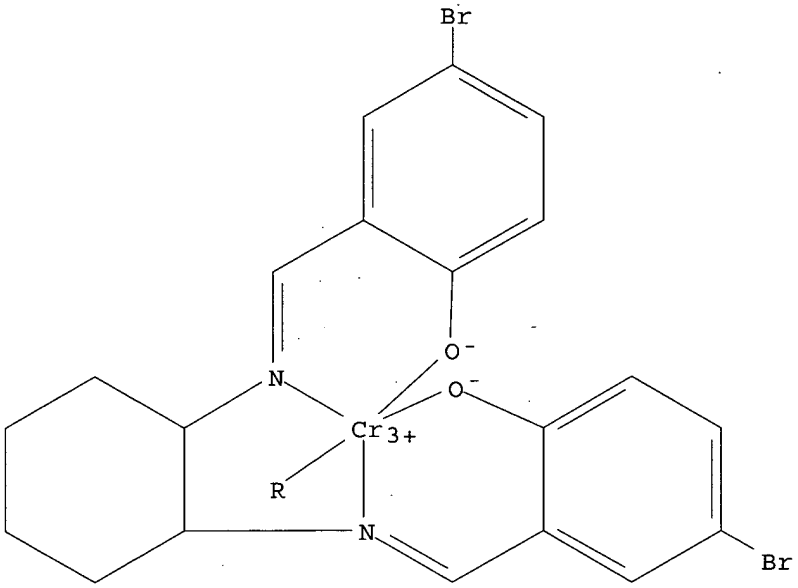


RN 181652-45-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-bromophenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

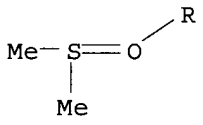
CM 1

CRN 181652-44-8
CMF C22 H24 Br2 Cr N2 O3 S
CCI CCS

PAGE 1-A

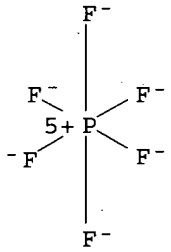


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

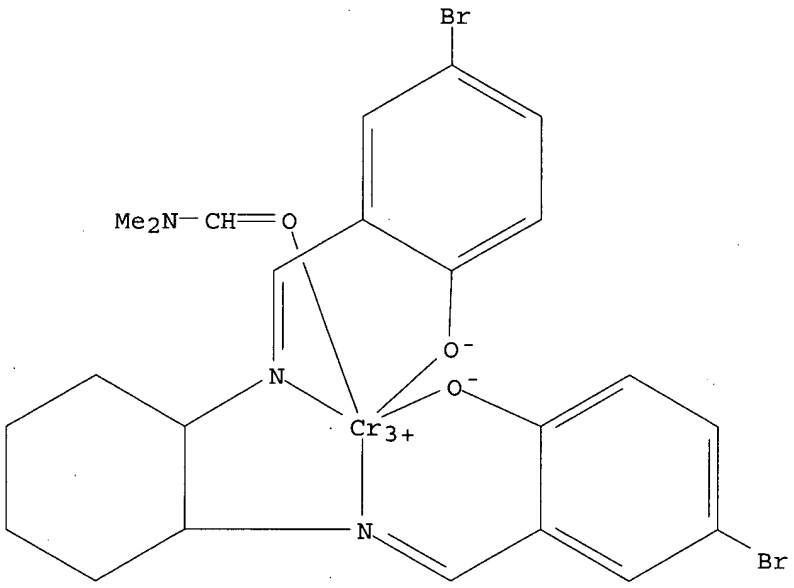


RN 181652-47-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-

bromophenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-,
[SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

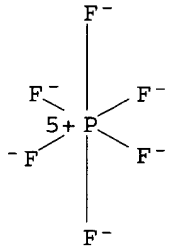
CM 1

CRN 181652-46-0
CMF C23 H25 Br2 Cr N3 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

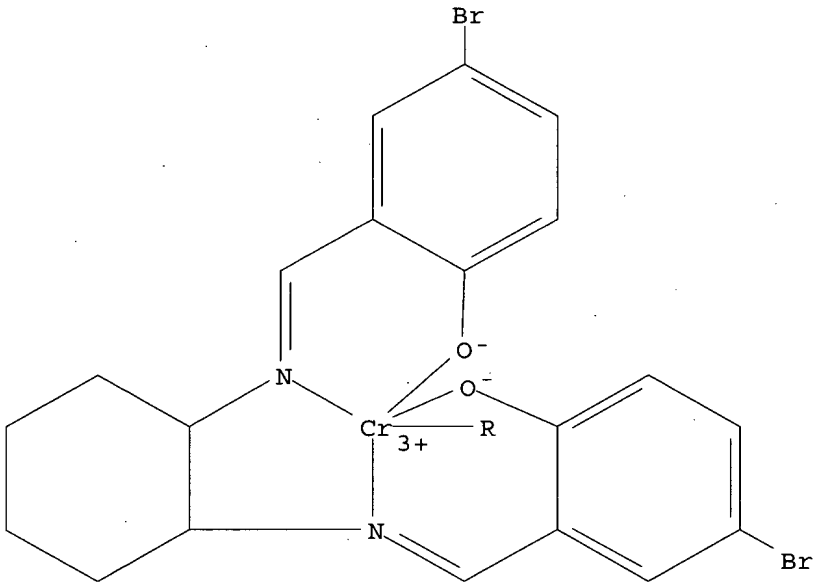


RN 181652-49-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-bromophenolato]](2-)-N,N',O,O'](pyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

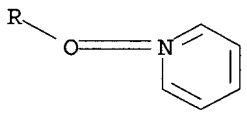
CM 1

CRN 181652-48-2
CMF C25 H23 Br2 Cr N3 O3
CCI CCS

PAGE 1-A

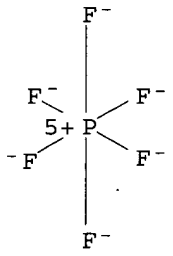


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

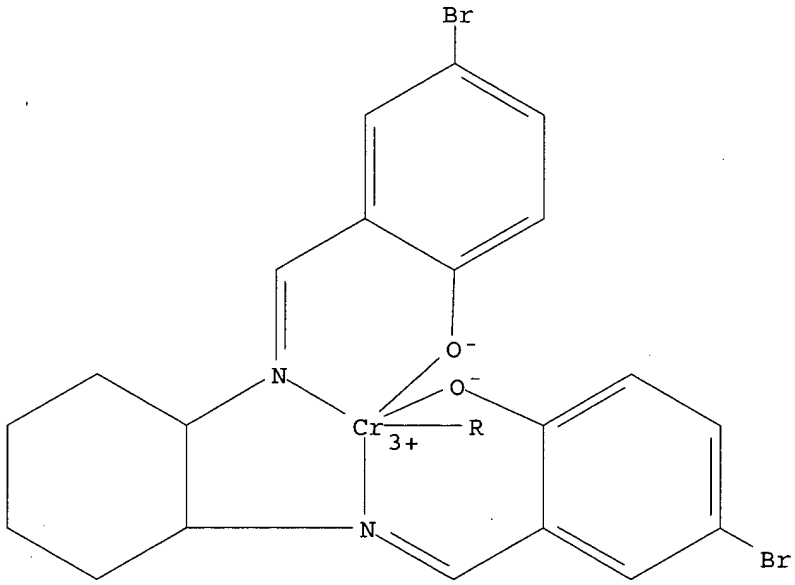


RN 181652-51-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-bromophenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

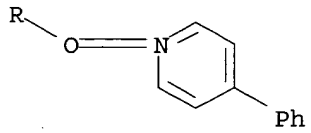
CM 1

CRN 181652-50-6
CMF C31 H27 Br2 Cr N3 O3
CCI CCS

PAGE 1-A

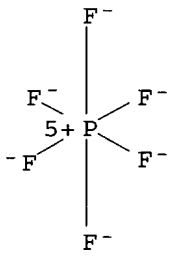


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

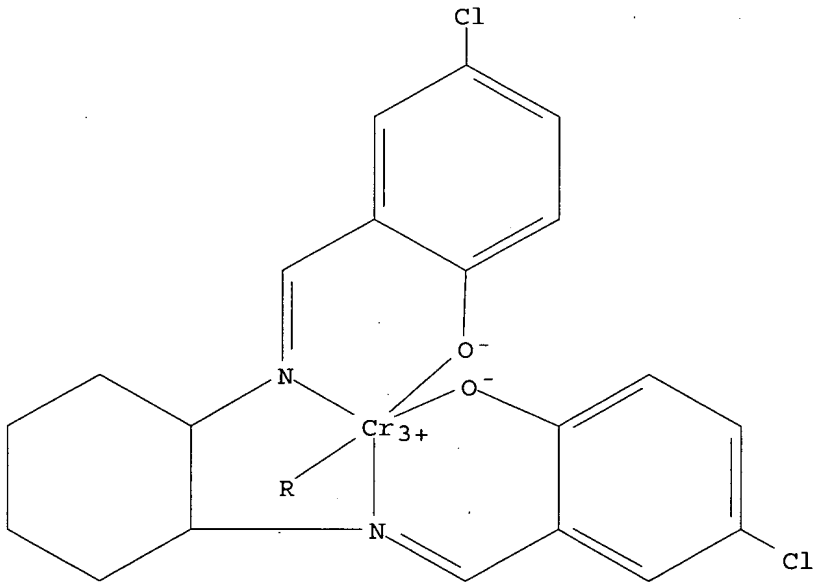


RN 181652-53-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

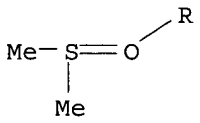
CM 1

CRN 181652-52-8
CMF C22 H24 Cl2 Cr N2 O3 S
CCI CCS

PAGE 1-A

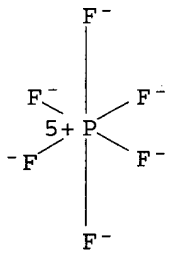


PAGE 2-A



CM 2

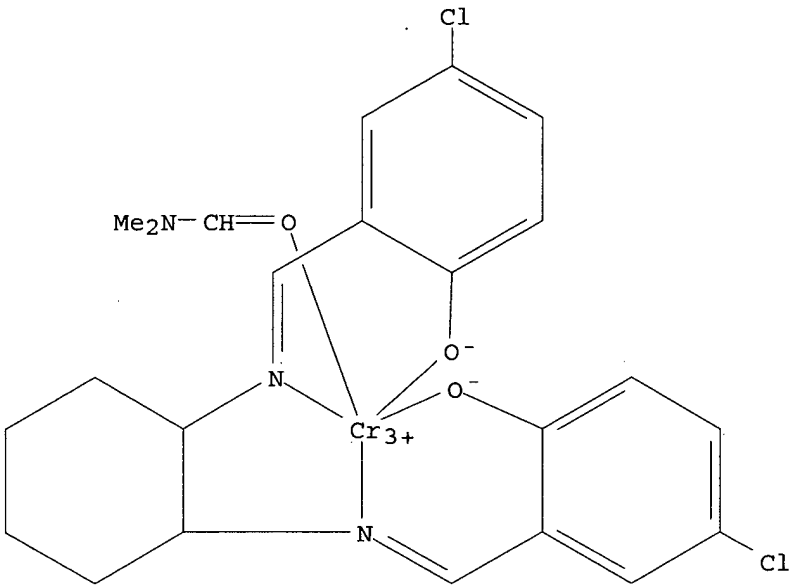
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-55-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

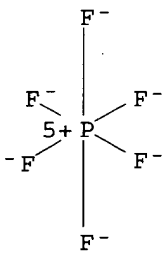
CM 1

CRN 181652-54-0
CMF C23 H25 Cl2 Cr N3 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

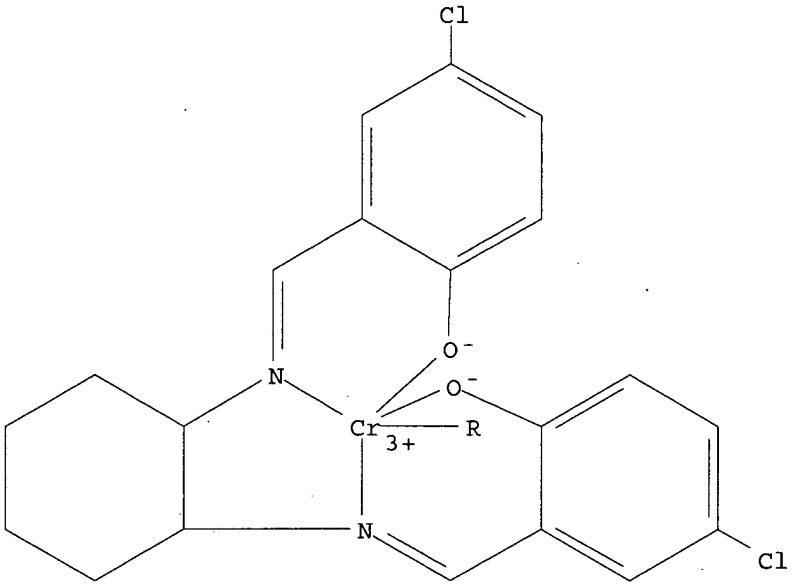


RN 181652-57-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'](pyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

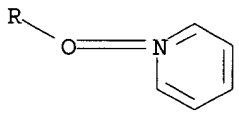
CM 1

CRN 181652-56-2
CMF C25 H23 Cl2 Cr N3 O3
CCI CCS

PAGE 1-A

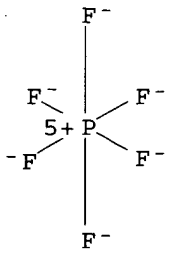


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



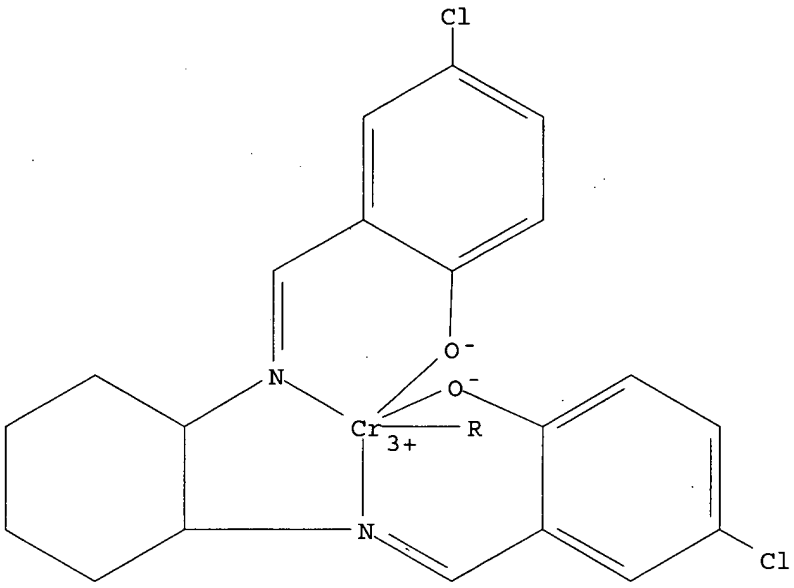
RN 181652-59-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-

chlorophenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-,
[SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

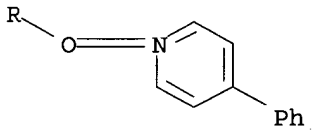
CM 1

CRN 181652-58-4
CMF C31 H27 Cl2 Cr N3 O3
CCI CCS

PAGE 1-A

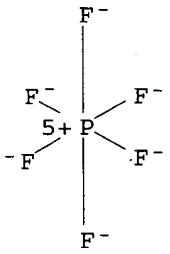


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

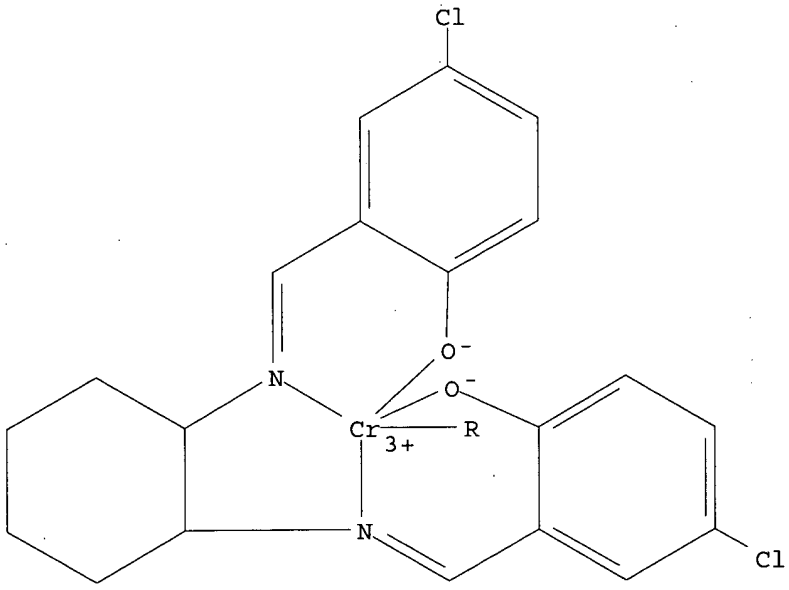


RN 181652-61-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][5-methyl-2-(1-methylethyl)cyclohexyl methylphenylphosphinato-O']-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

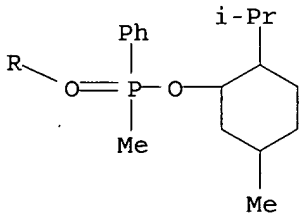
CM 1

CRN 181652-60-8
CMF C37 H45 Cl2 Cr N2 O4 P
CCI CCS

PAGE 1-A

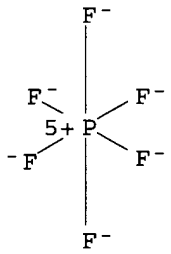


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

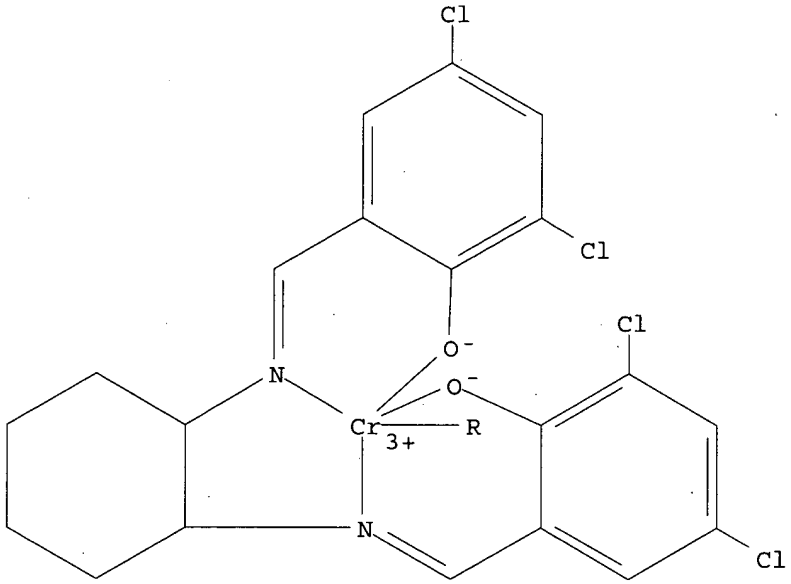


RN 181652-63-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4,6-dichlorophenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

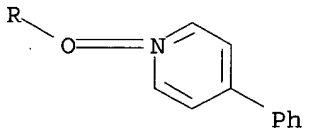
CM 1

CRN 181652-62-0
CMF C31 H25 Cl4 Cr N3 O3
CCI CCS

PAGE 1-A

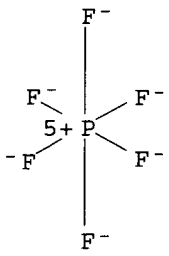


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



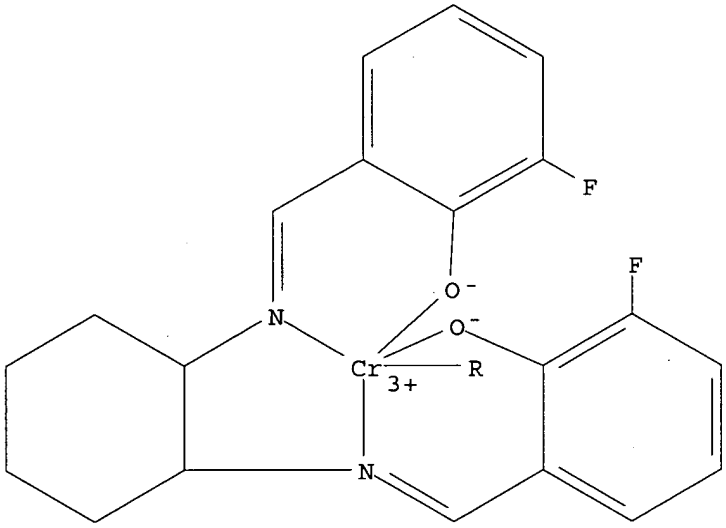
RN 181652-65-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-

fluorophenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-,
[SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

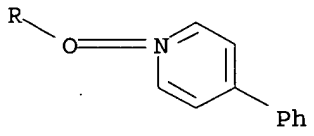
CM 1

CRN 181652-64-2
CMF C31 H27 Cr F2 N3 O3
CCI CCS

PAGE 1-A

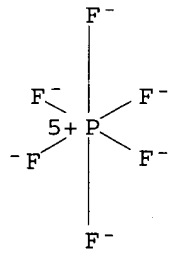


PAGE 2-A



CM 2

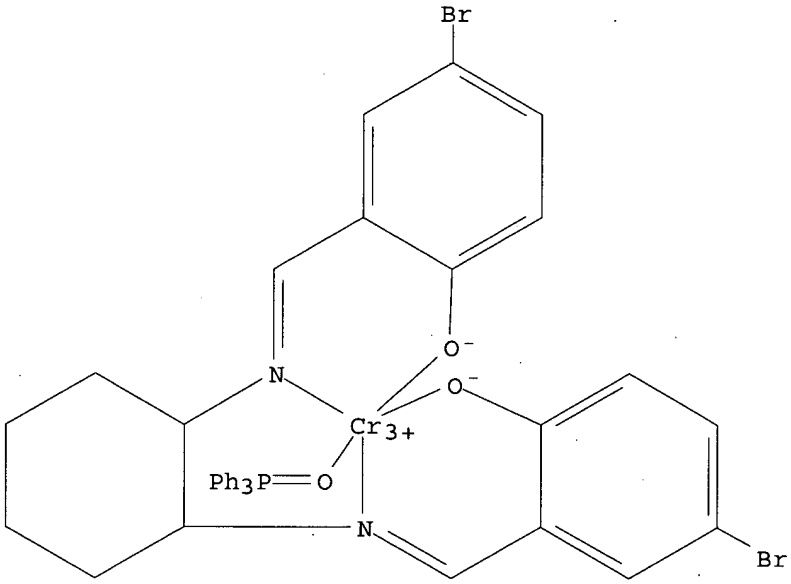
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-67-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-bromophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

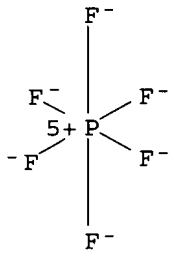
CM 1

CRN 181652-66-4
CMF C38 H33 Br2 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

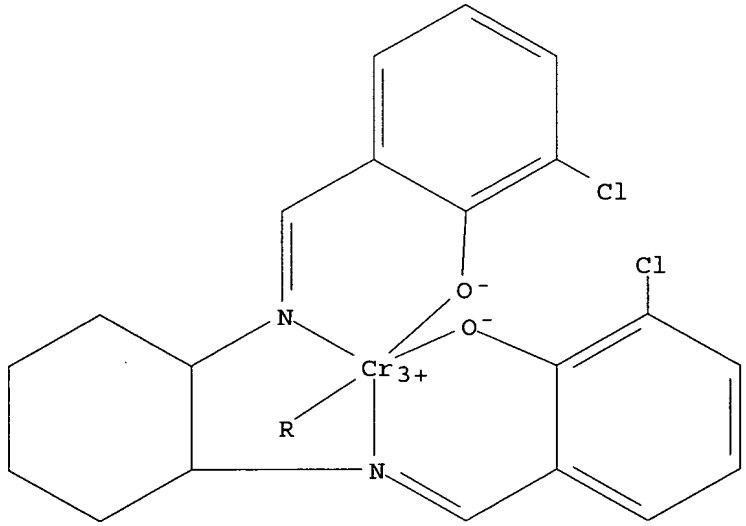


RN 181652-69-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

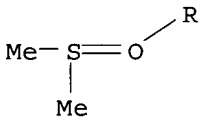
CM 1

CRN 181652-68-6
CMF C22 H24 Cl2 Cr N2 O3 S
CCI CCS

PAGE 1-A

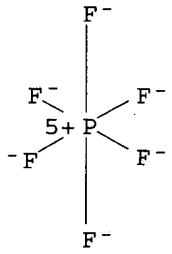


PAGE 2-A



CM 2

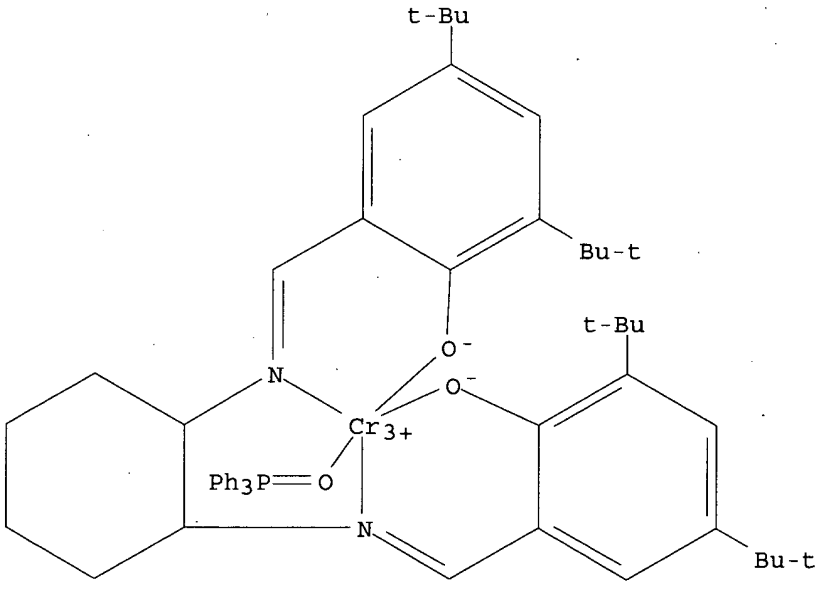
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-71-1 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4,6-bis(1,1-dimethylethyl)phenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

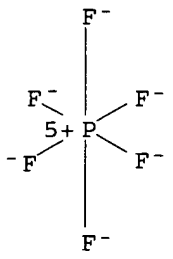
CM 1

CRN 181652-70-0
CMF C54 H67 Cr N2 O3 P
CCI CCS



CM 2

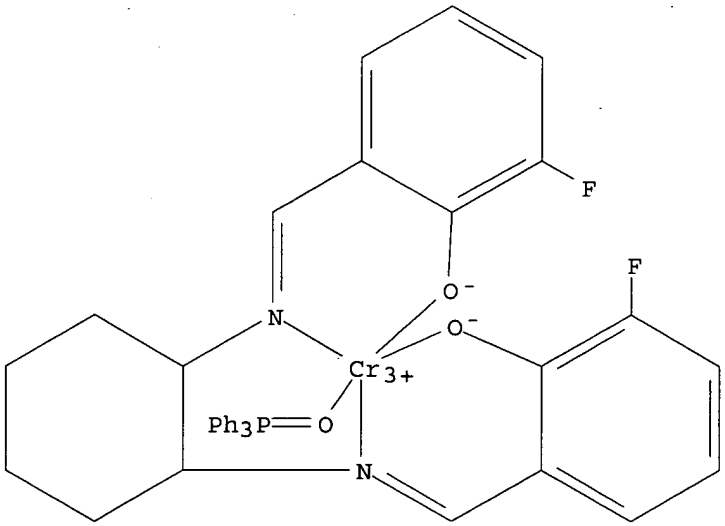
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-73-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-fluorophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

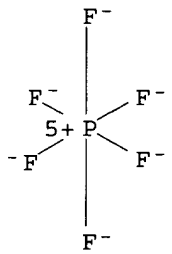
CM 1

CRN 181652-72-2
CMF C38 H33 Cr F2 N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

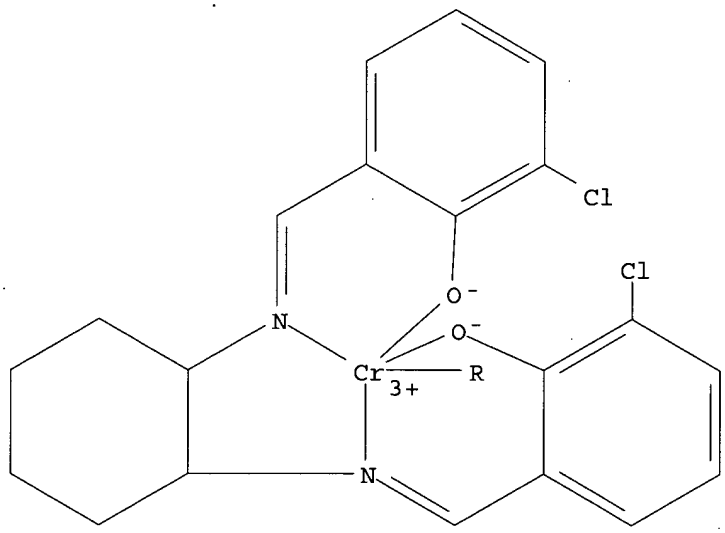


RN 181652-75-5 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

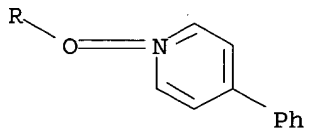
CM 1

CRN 181652-74-4
CMF C31 H27 Cl2 Cr N3 O3
CCI CCS

PAGE 1-A

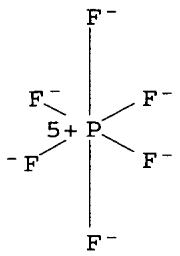


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

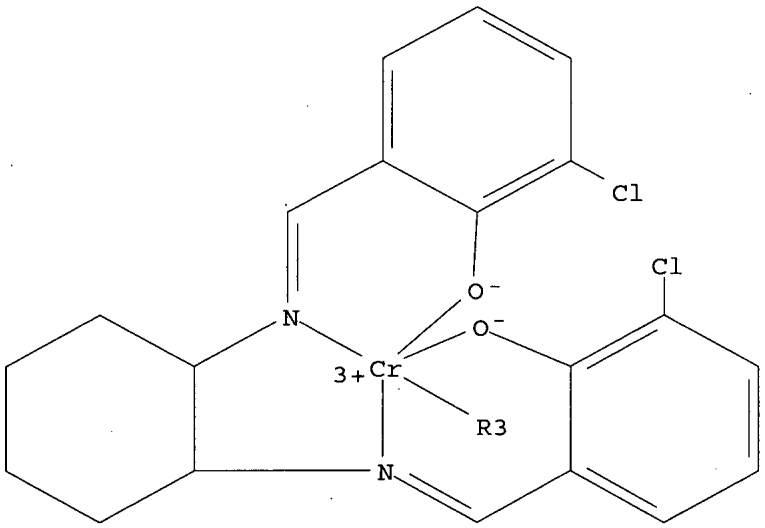


RN 181652-77-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'][tris(2,4,6-trimethylphenyl)phosphine oxide-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

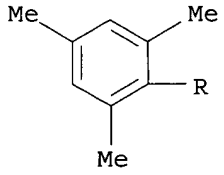
CM 1

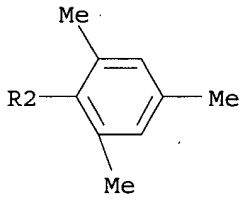
CRN 181652-76-6
CMF C47 H51 Cl2 Cr N2 O3 P
CCI CCS

PAGE 1-A

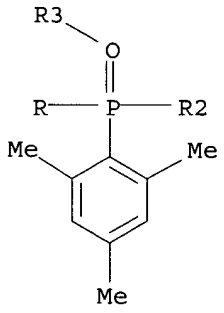


PAGE 2-A



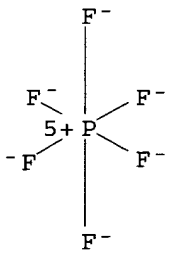


PAGE 3-A



CM 2

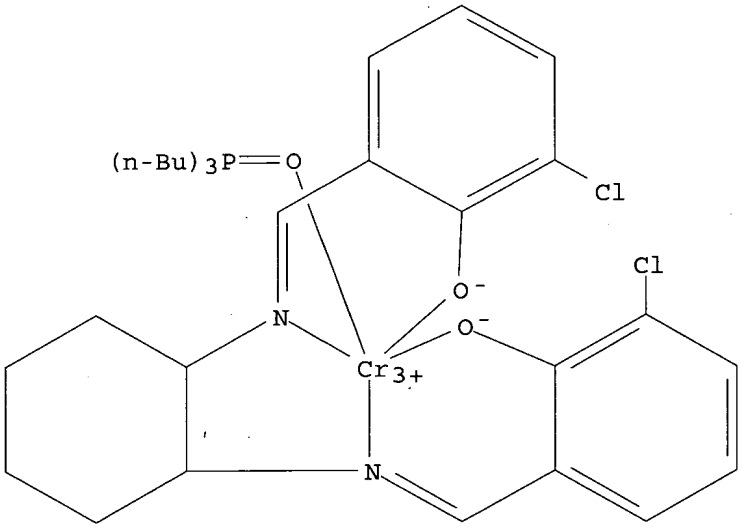
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181652-79-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](tributylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

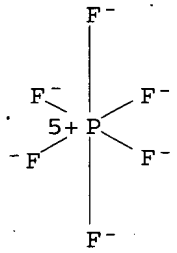
CM 1

CRN 181652-78-8
CMF C32 H45 Cl2 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

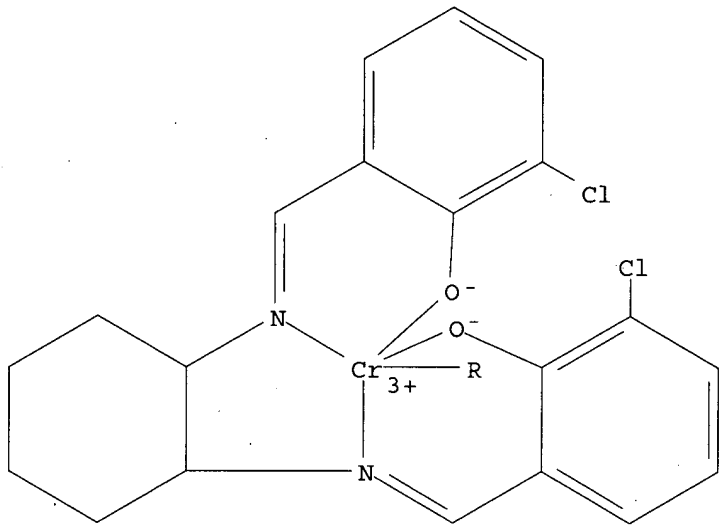


RN 181652-82-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'][(4-methoxyphenyl)methylphenylphosphine oxide]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

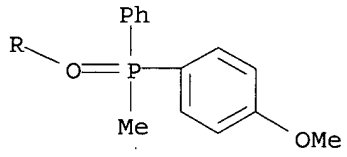
CM 1

CRN 181652-81-3
CMF C34 H33 Cl2 Cr N2 O4 P
CCI CCS

PAGE 1-A

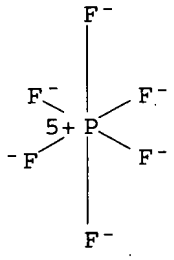


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

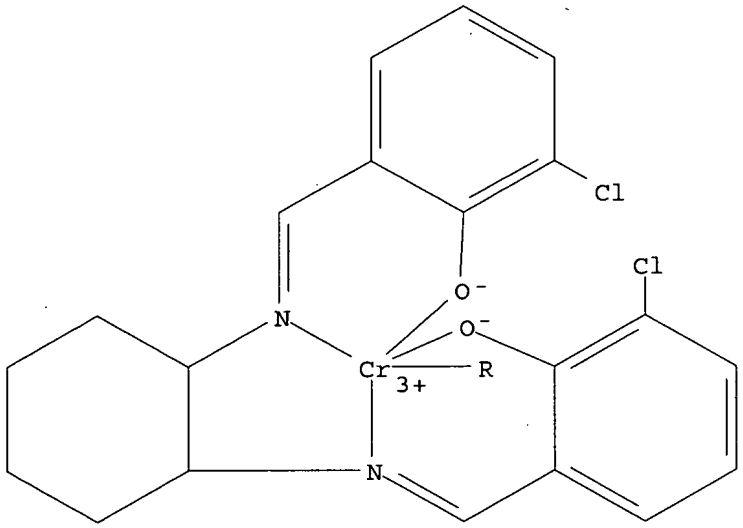


RN 181652-84-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](methyl-1-naphthalenylphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

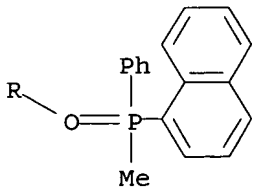
CM 1

CRN 181652-83-5
CMF C37 H33 Cl2 Cr N2 O3 P
CCI CCS

PAGE 1-A

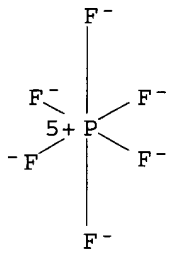


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

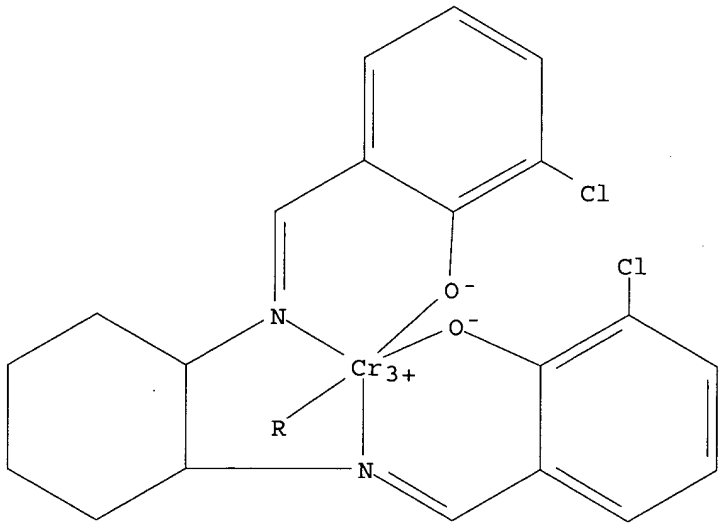


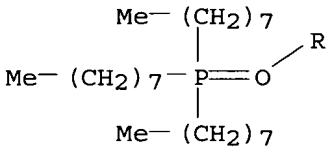
RN 181652-86-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](trioctylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 181652-85-7
CMF C44 H69 Cl2 Cr N2 O3 P
CCI CCS

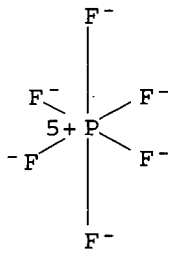
PAGE 1-A





CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

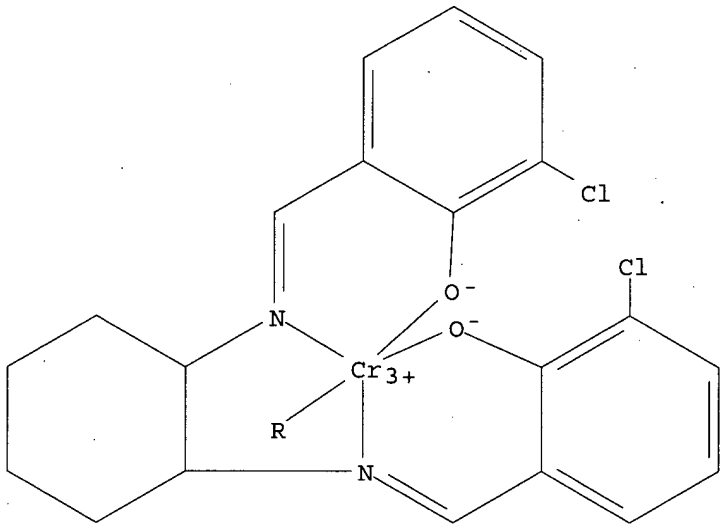


RN 181652-88-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](trihexyl phosphate-O''')-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

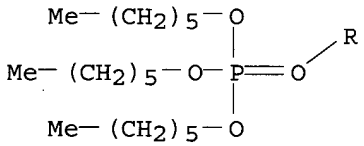
CM 1

CRN 181652-87-9
CMF C38 H57 Cl2 Cr N2 O6 P
CCI CCS

PAGE 1-A

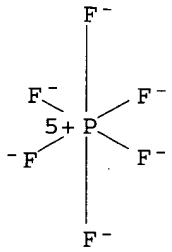


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



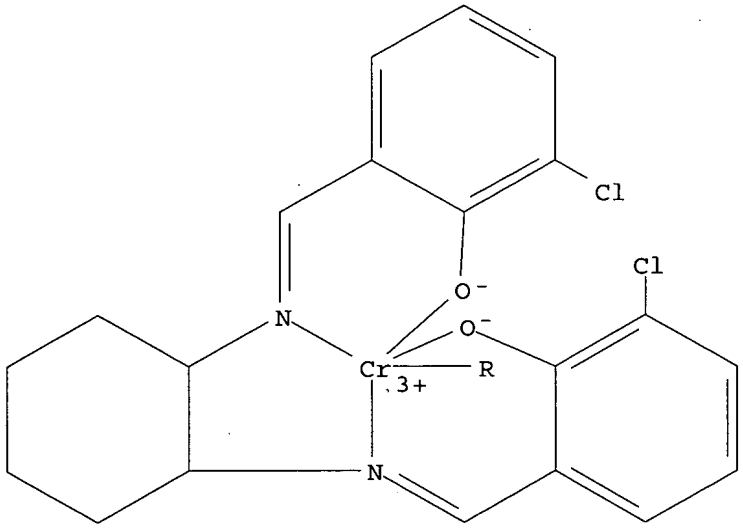
RN 181652-90-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'][tris(4-methylphenyl) phosphate-O''']-,

[SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

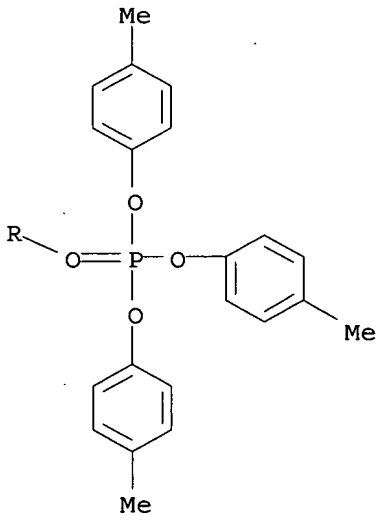
CM 1

CRN 181652-89-1
CMF C41 H39 Cl2 Cr N2 O6 P
CCI CCS

PAGE 1-A

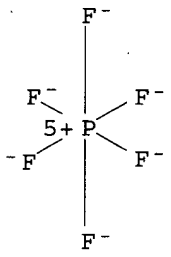


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

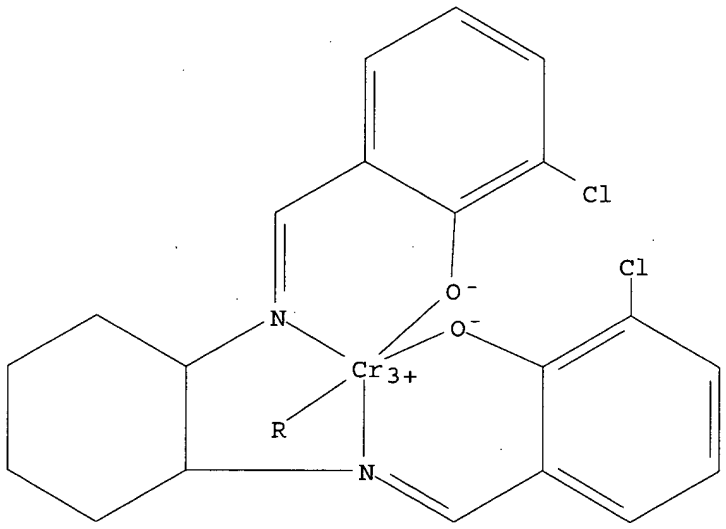


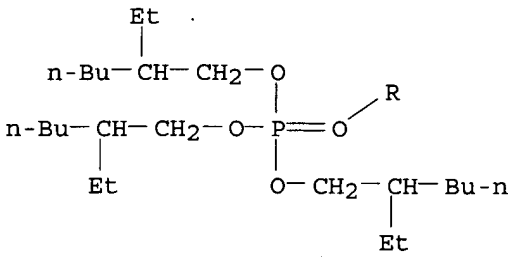
RN 181652-92-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'][tris(2-ethylhexyl) phosphate-O''']-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 181652-91-5
CMF C44 H69 Cl2 Cr N2 O6 P
CCI CCS

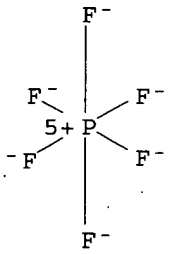
PAGE 1-A





CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

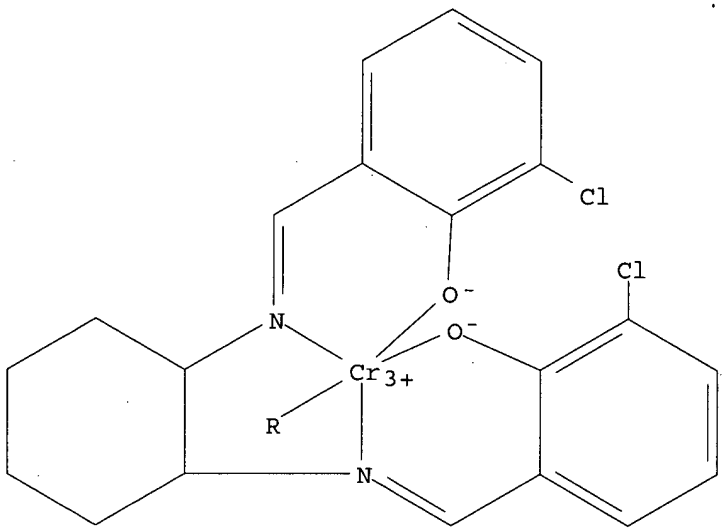


RN 181652-94-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](triethyl phosphate-O''')-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

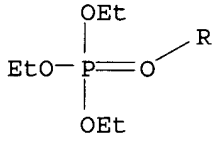
CM 1

CRN 181652-93-7
CMF C26 H33 Cl2 Cr N2 O6 P
CCI CCS

PAGE 1-A

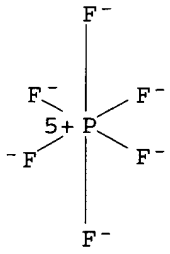


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

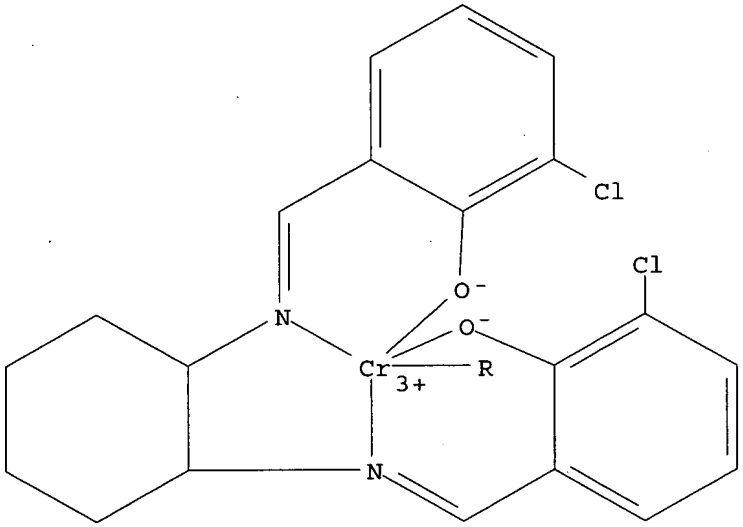


RN 181652-96-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'][1,1',1''-phosphinylidynetris[pyrrolidine]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

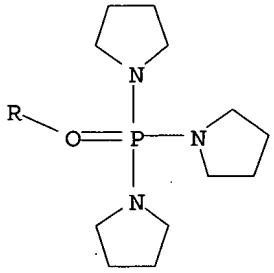
CM 1

CRN 181652-95-9
CMF C32 H42 Cl2 Cr N5 O3 P
CCI CCS

PAGE 1-A

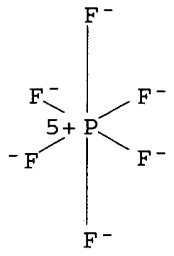


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

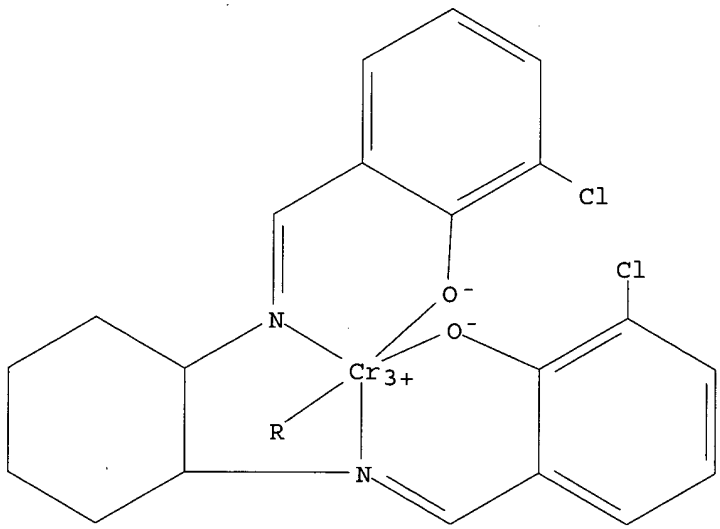


RN 181652-98-2 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](methyldiphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

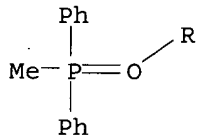
CM 1

CRN 181652-97-1
CMF C33 H31 Cl2 Cr N2 O3 P
CCI CCS

PAGE 1-A

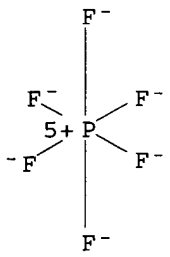


PAGE 2-A



CM 2

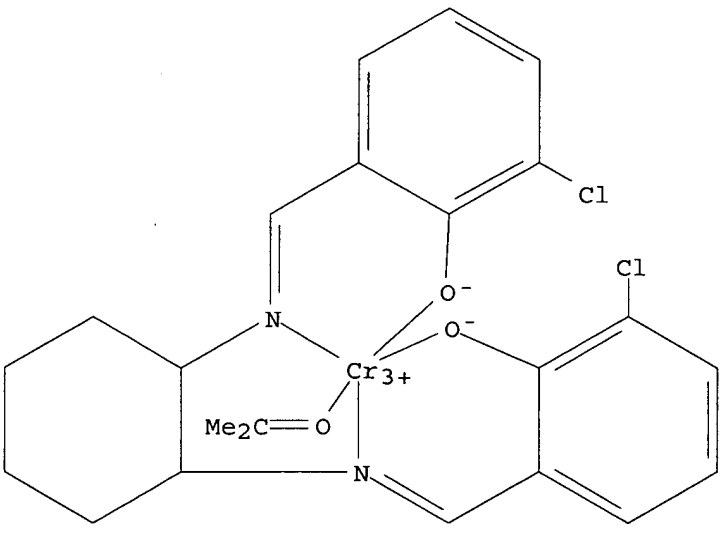
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-01-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](2-propanone)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

CM 1

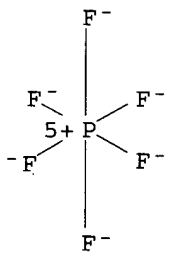
CRN 181653-00-9
CMF C23 H24 Cl2 Cr N2 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P

CCI CCS

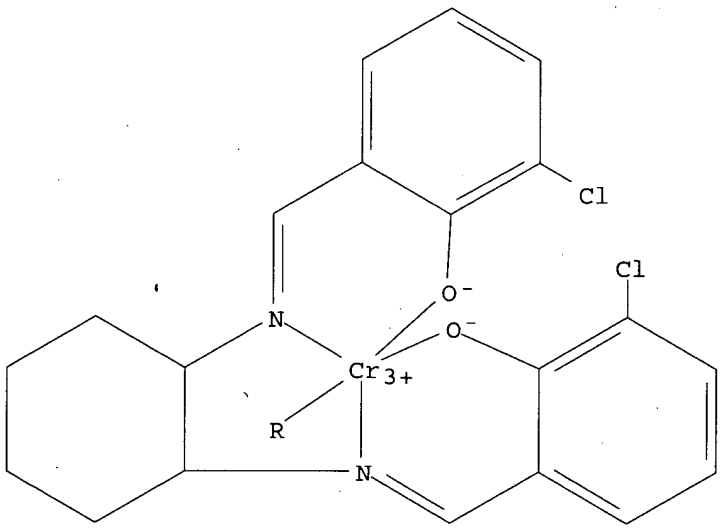


RN 181653-03-2 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](ethyl acetate-O')-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

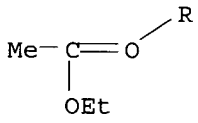
CM 1

CRN 181653-02-1
CMF C24 H26 Cl2 Cr N2 O4
CCI CCS

PAGE 1-A

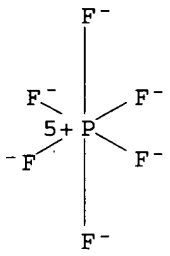


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

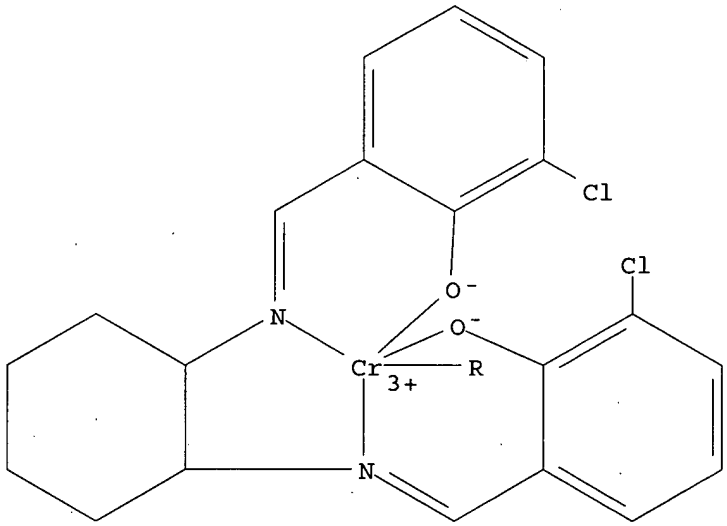


RN 181653-05-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](tetrahydrothiophene 1,1-dioxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

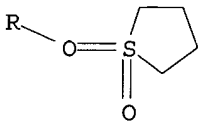
CM 1

CRN 181653-04-3
CMF C24 H26 Cl2 Cr N2 O4 S
CCI CCS

PAGE 1-A

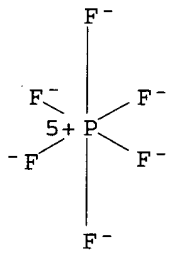


PAGE 2-A



CM 2

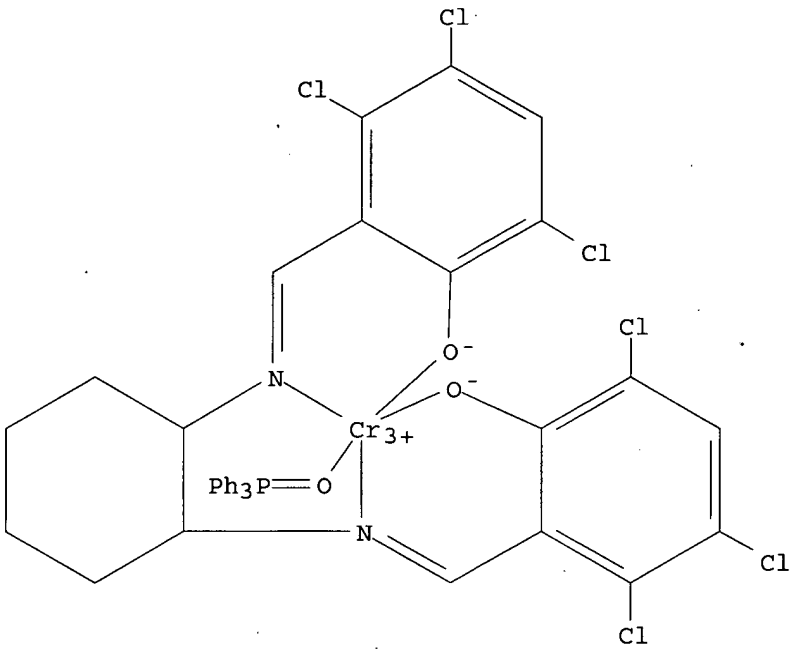
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-07-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[3,4,6-trichlorophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

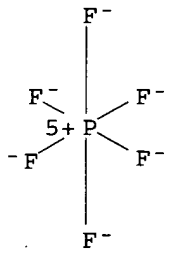
CM 1

CRN 181653-06-5
CMF C38 H29 Cl6 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

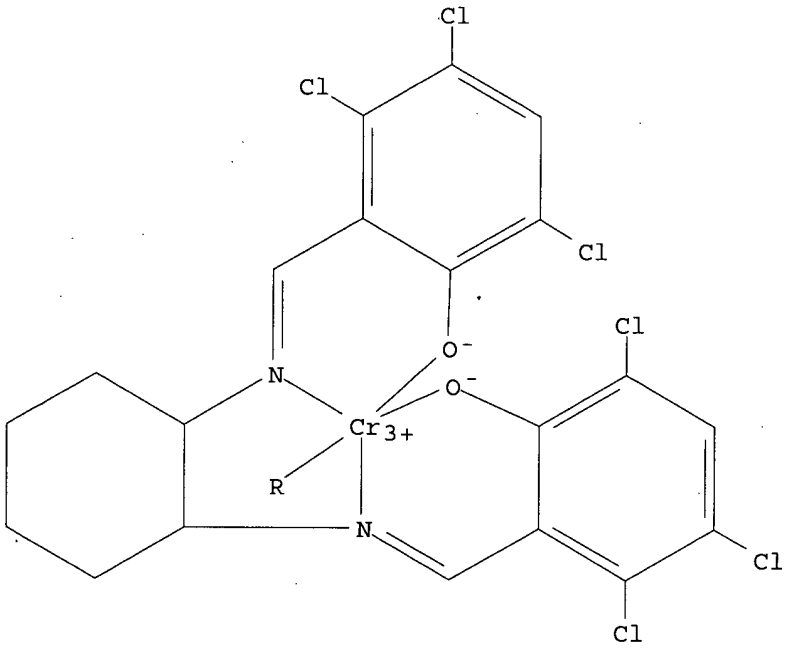


RN 181653-09-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[3,4,6-trichlorophenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

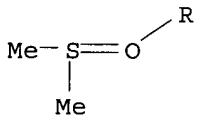
CM 1

CRN 181653-08-7
CMF C22 H20 Cl6 Cr N2 O3 S
CCI CCS

PAGE 1-A

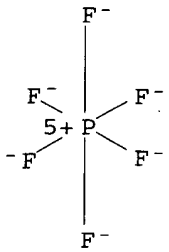


PAGE 2-A



CM 2

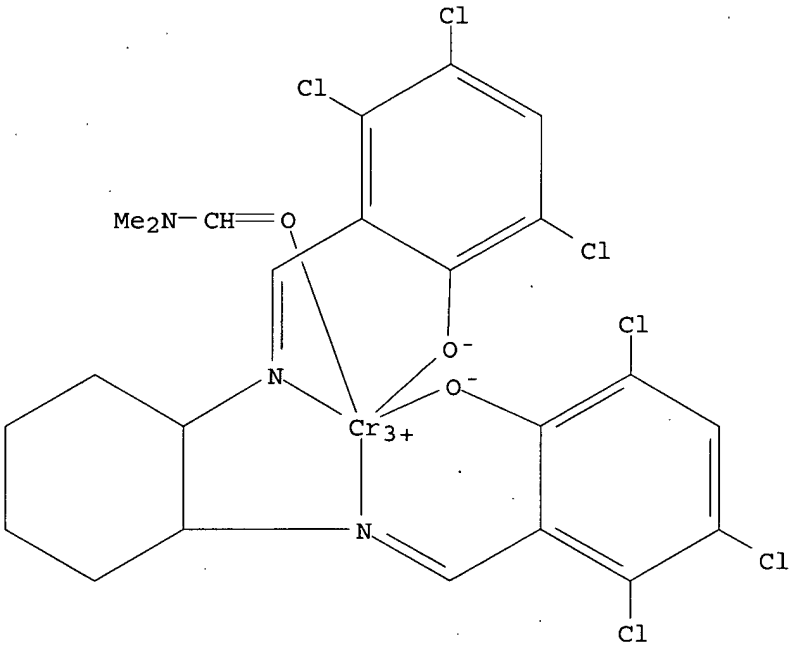
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-11-2 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[3,4,6-trichlorophenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

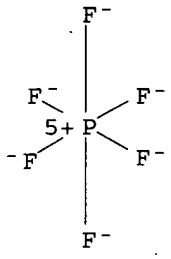
CM 1

CRN 181653-10-1
CMF C23 H21 Cl6 Cr N3 O3
CCI CCS



CM 2

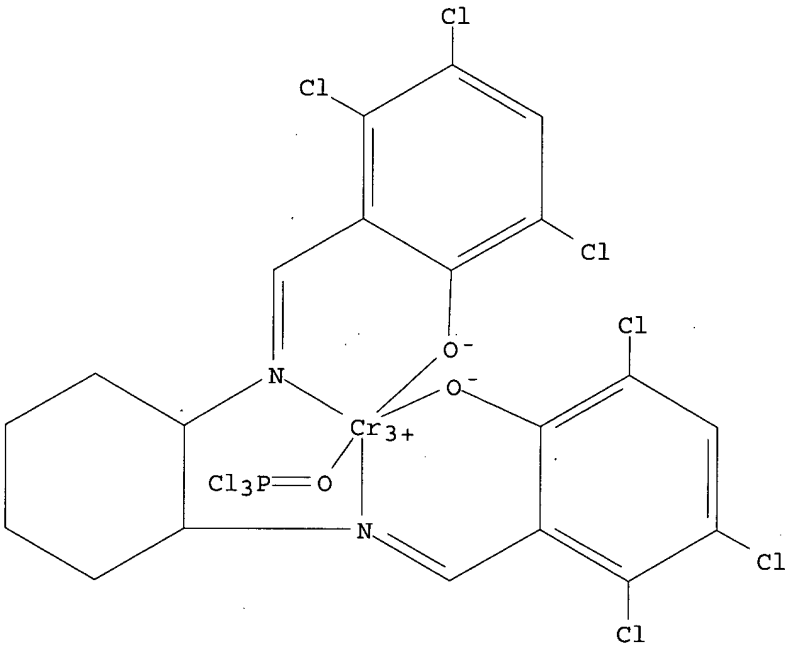
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-13-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[3,4,6-trichlorophenolato]](2-)-N,N',O,O'](phosphoric trichloride-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

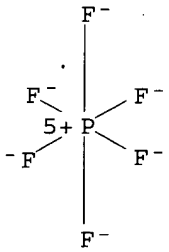
CM 1

CRN 181653-12-3
CMF C20 H14 Cl9 Cr N2 O3 P
CCI CCS



CM 2

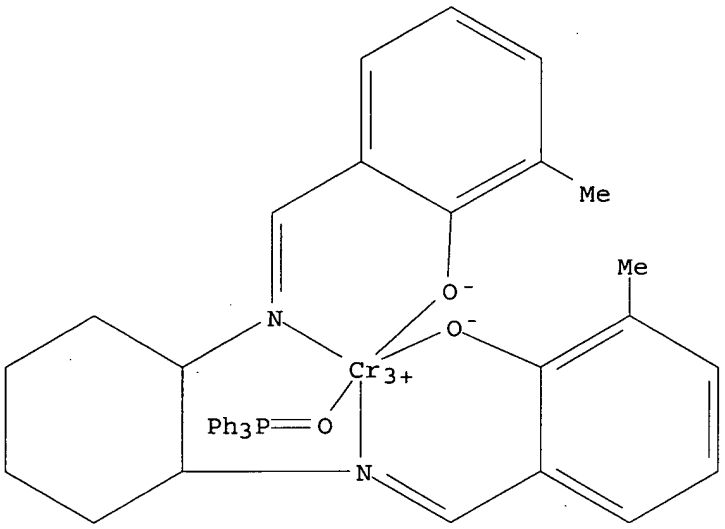
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-15-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-methylphenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

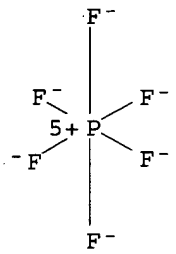
CM 1

CRN 181653-14-5
CMF C40 H39 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

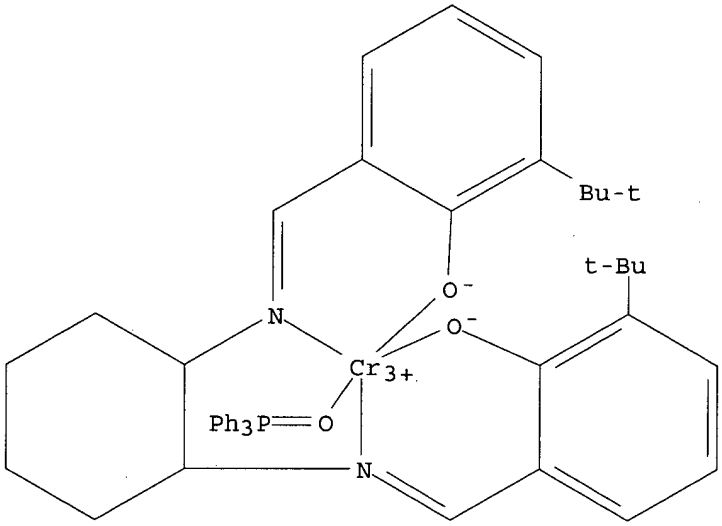


RN 181653-17-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-(1,1-dimethylethyl)phenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX

NAME)

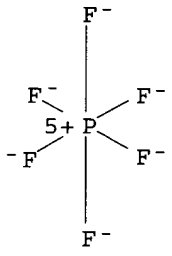
CM 1

CRN 181653-16-7
CMF C46 H51 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

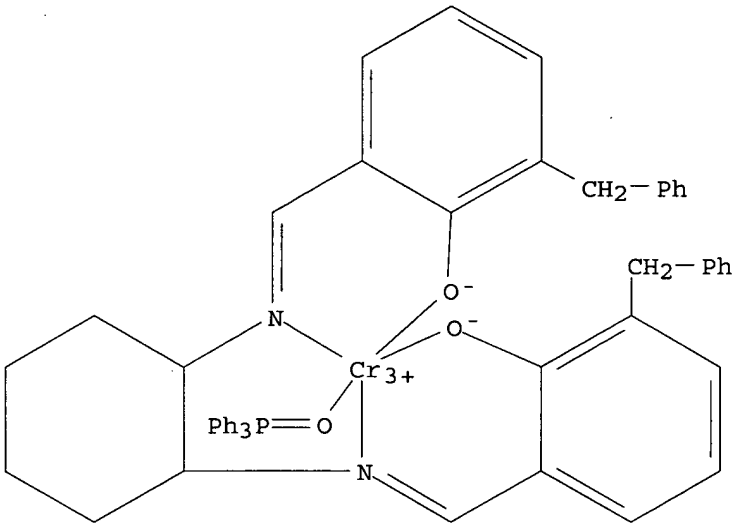


RN 181653-20-3 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-(phenylmethyl)phenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

CM 1

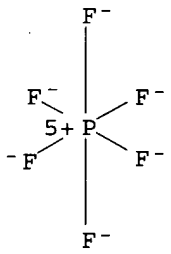
CRN 181653-19-0

CMF C52 H47 Cr N2 O3 P
CCI CCS



CM 2

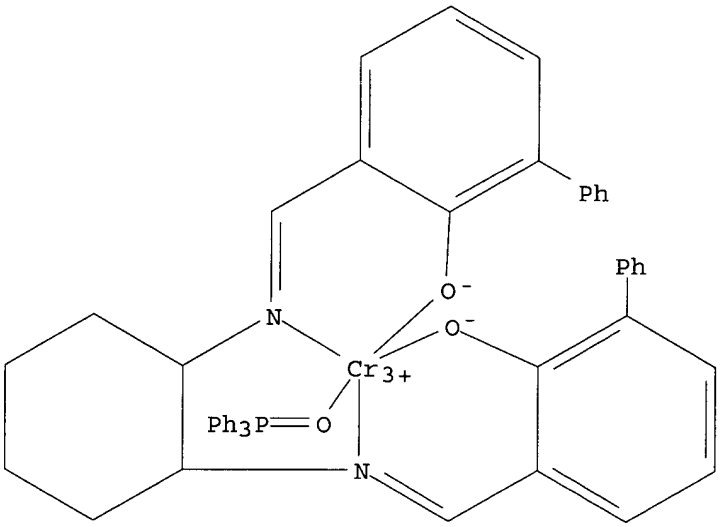
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-22-5 HCAPLUS
CN Chromium(1+), [[3,3''-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[[1,1'-biphenyl]-2-olato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

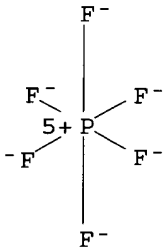
CM 1

CRN 181653-21-4
CMF C50 H43 Cr N2 O3 P
CCI CCS



CM 2

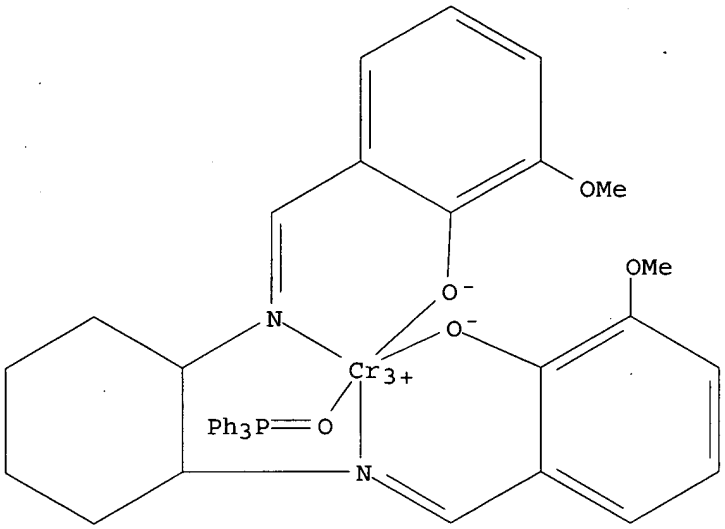
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-24-7 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-methoxyphenolato]](2-)-N2,N2',O1,O1'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

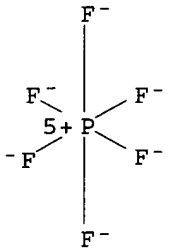
CM 1

CRN 181653-23-6
CMF C40 H39 Cr N2 O5 P
CCI CCS



CM 2

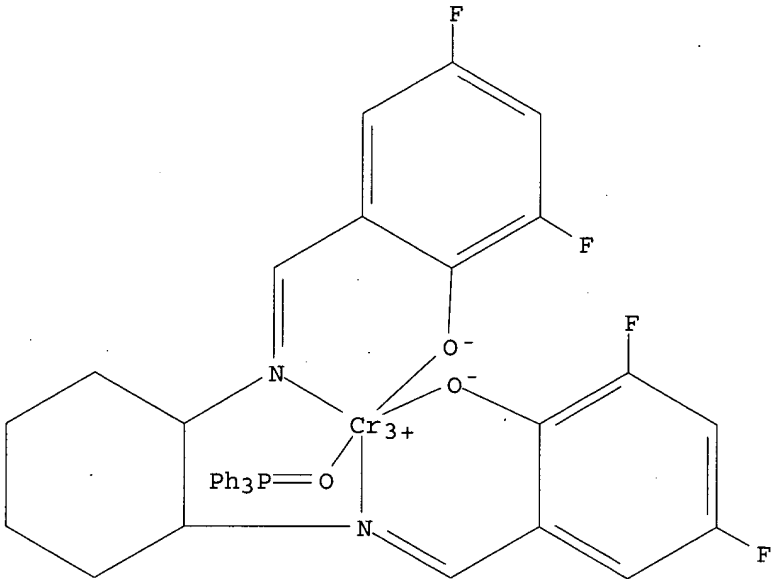
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-27-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4,6-difluorophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

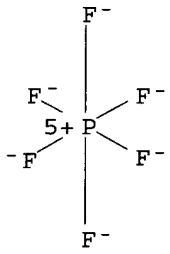
CM 1

CRN 181653-26-9
CMF C38 H31 Cr F4 N2 O3 P
CCI CCS



CM 2

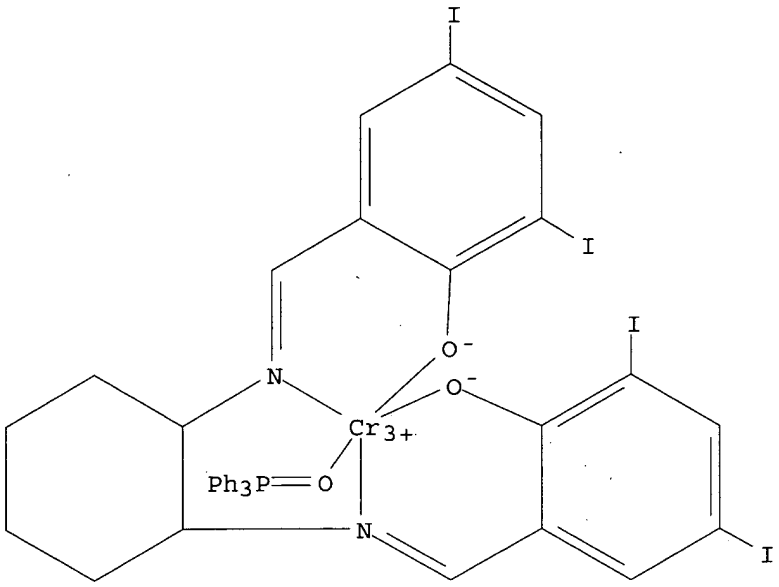
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-31-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4,6-diiodophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

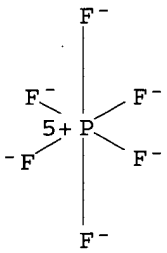
CM 1

CRN 181653-30-5
CMF C38 H31 Cr I4 N2 O3 P
CCI CCS



CM 2

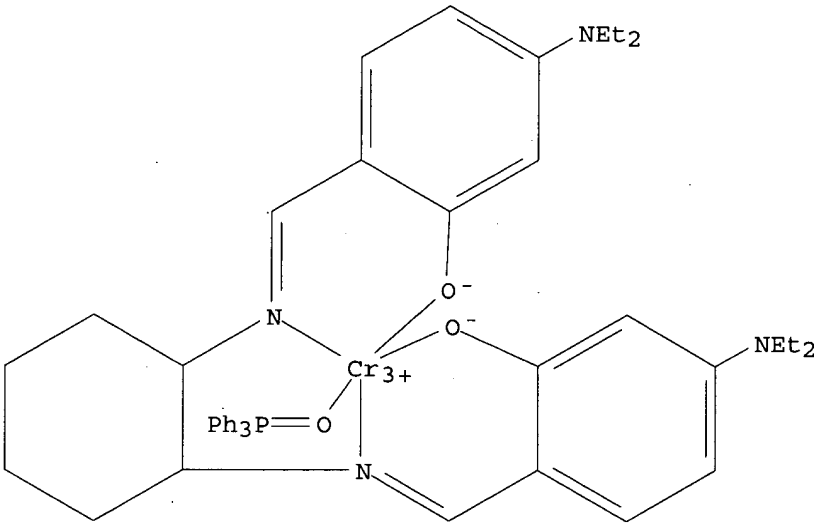
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-33-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[5-(diethylamino)phenolato]](2-)-N2,N2',O1,O1'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

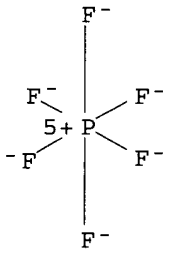
CM 1

CRN 181653-32-7
CMF C46 H53 Cr N4 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-35-0 HCAPLUS
CN Chromium(1+), [[1,1'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[2-naphthalenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

CM 1

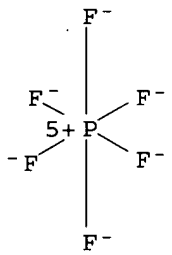
CRN 181653-34-9
CMF C46 H39 Cr N2 O3 P
CCI CCS

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 16919-18-9
CMF F6 P

CCI CCS

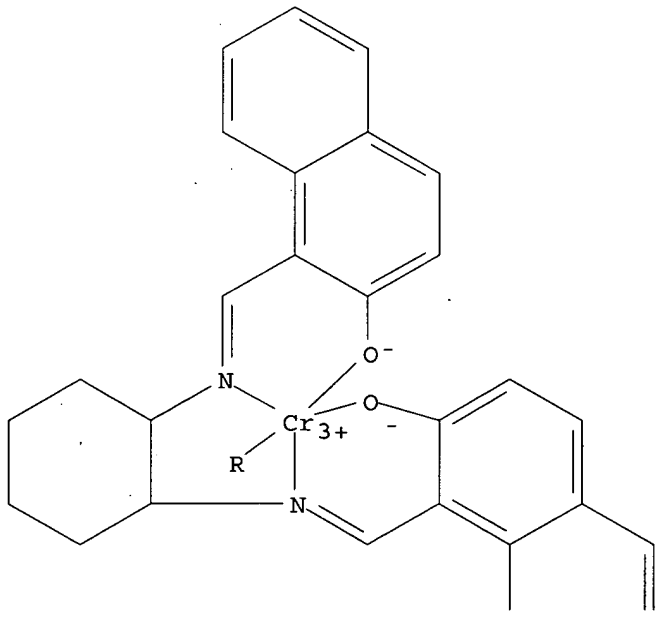


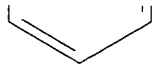
RN 181653-37-2 HCAPLUS
CN Chromium(1+), [[1,1'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[2-naphthalenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

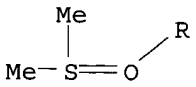
CM 1

CRN 181653-36-1
CMF C30 H30 Cr N2 O3 S
CCI CCS

PAGE 1-A

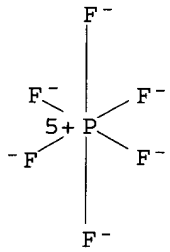






CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-39-4 HCAPLUS
CN Chromium(1+), [[1,1'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[2-naphthalenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

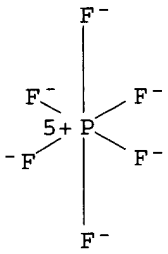
CM 1

CRN 181653-38-3
CMF C31 H31 Cr N3 O3
CCI CCS

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

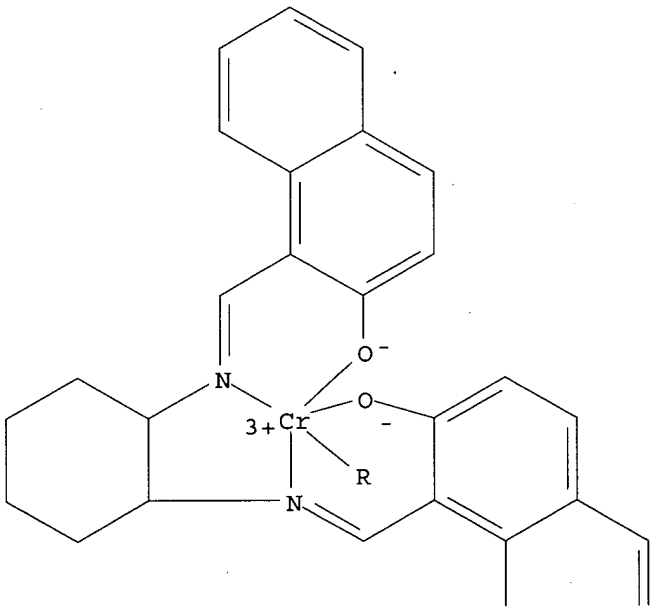


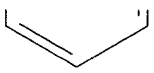
RN 181653-41-8 HCAPLUS
CN Chromium(1+), [[1,1'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[2-naphthalenolato]](2-)-N,N',O,O'](pyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

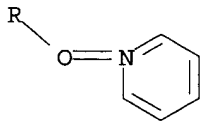
CM 1

CRN 181653-40-7
CMF C33 H29 Cr N3 O3
CCI CCS

PAGE 1-A

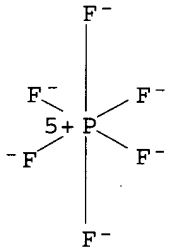






CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

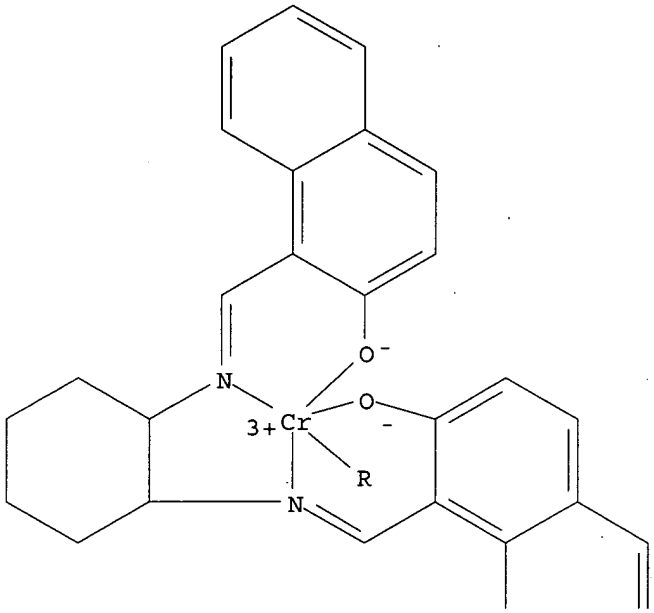


RN 181653-43-0 HCAPLUS
CN Chromium(1+), [[1,1'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[2-naphthalenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

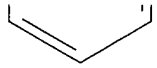
CM 1

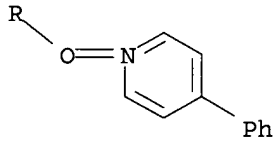
CRN 181653-42-9
CMF C39 H33 Cr N3 O3
CCI CCS

PAGE 1-A



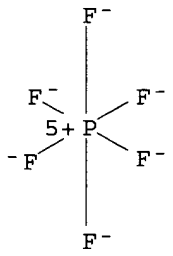
PAGE 2-A





CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

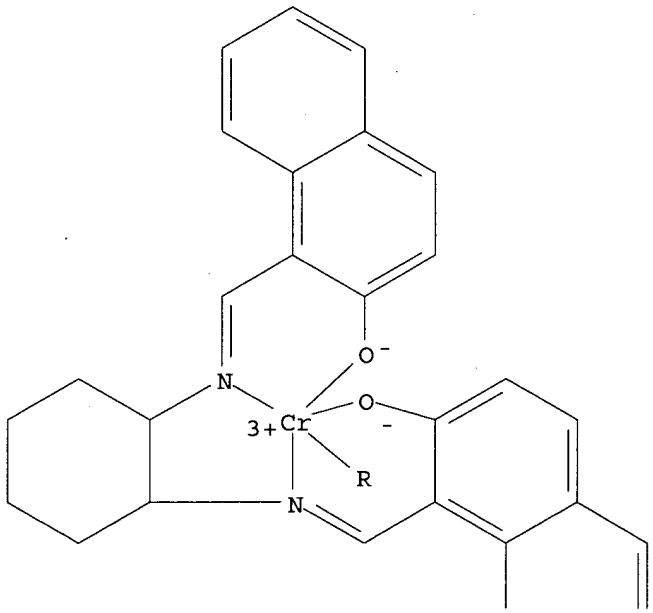


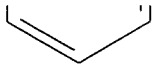
RN 181653-45-2 HCAPLUS
CN Chromium(1+), [[1,1'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[2-naphthalenolato]](2-)-N,N',O,O'](2-methylpyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

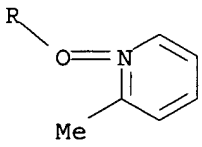
CM 1

CRN 181653-44-1
CMF C34 H31 Cr N3 O3
CCI CCS

PAGE 1-A

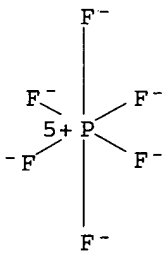






CM 2

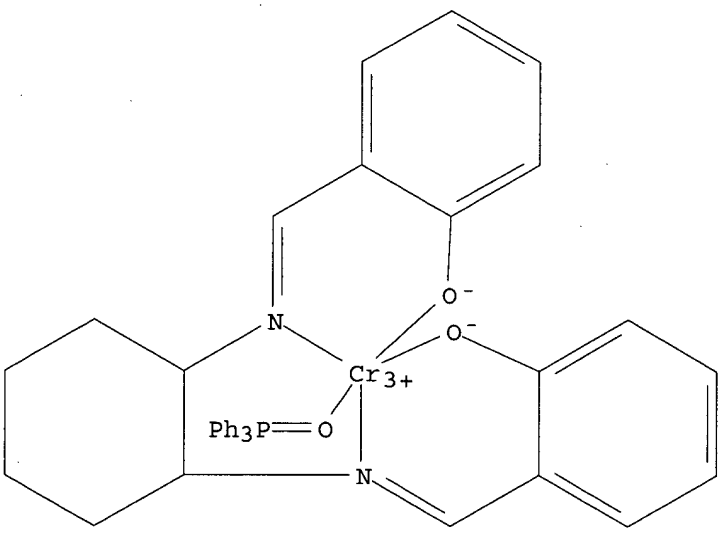
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-47-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

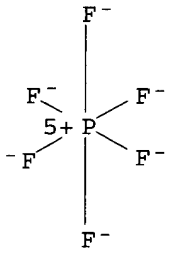
CM 1

CRN 181653-46-3
CMF C38 H35 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

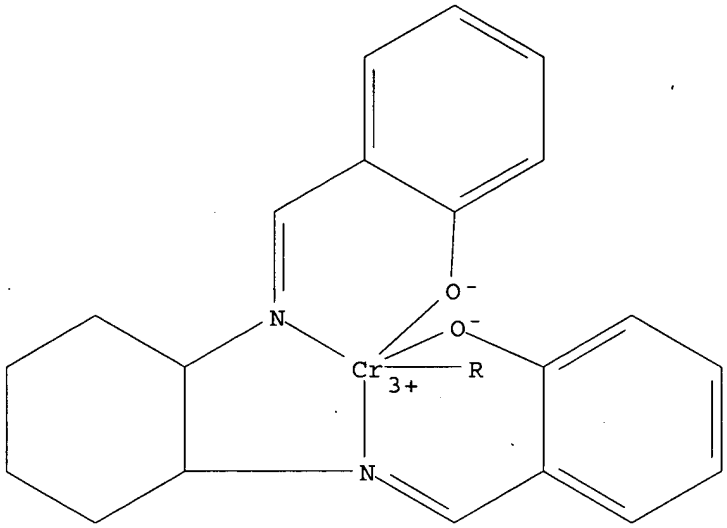


RN 181653-49-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

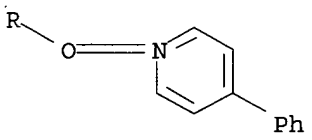
CM 1

CRN 181653-48-5
CMF C31 H29 Cr N3 O3
CCI CCS

PAGE 1-A

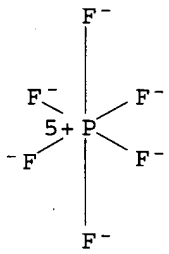


PAGE 2-A



CM 2

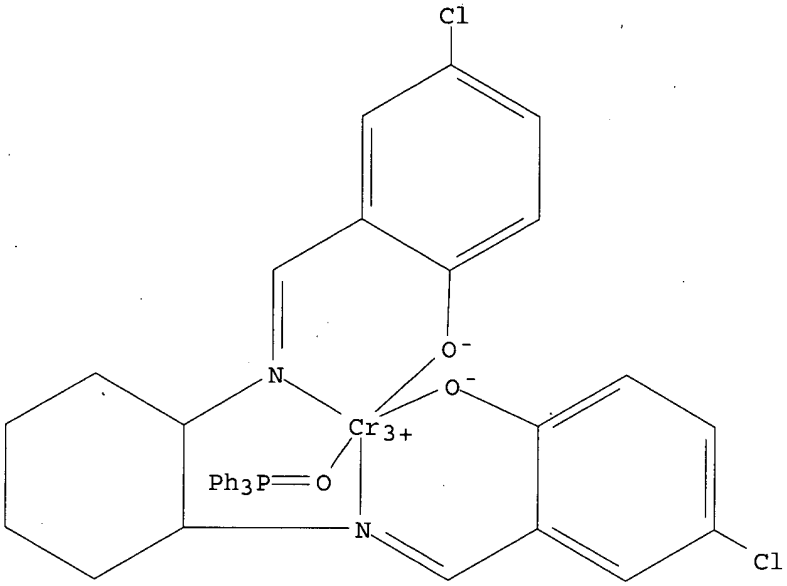
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-51-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

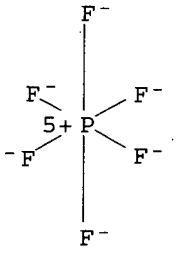
CM 1

CRN 181653-50-9
CMF C38 H33 Cl2 Cr N2 O3 P
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

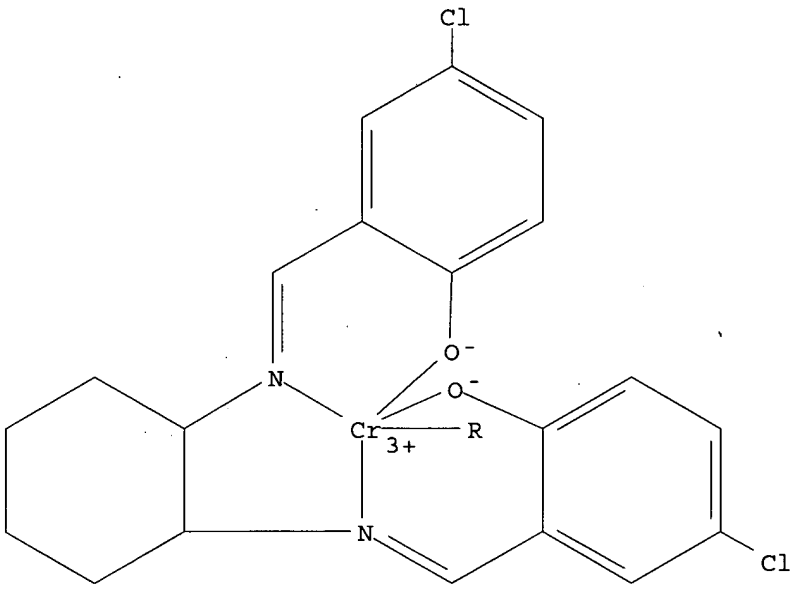


RN 181653-53-2 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][methyl(4-methylphenyl)phenylphosphine oxide-O]-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

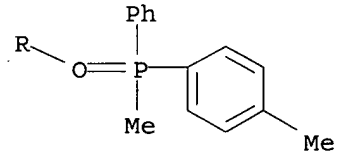
CM 1

CRN 181653-52-1
CMF C34 H33 Cl2 Cr N2 O3 P
CCI CCS

PAGE 1-A

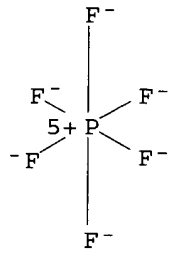


PAGE 2-A



CM 2

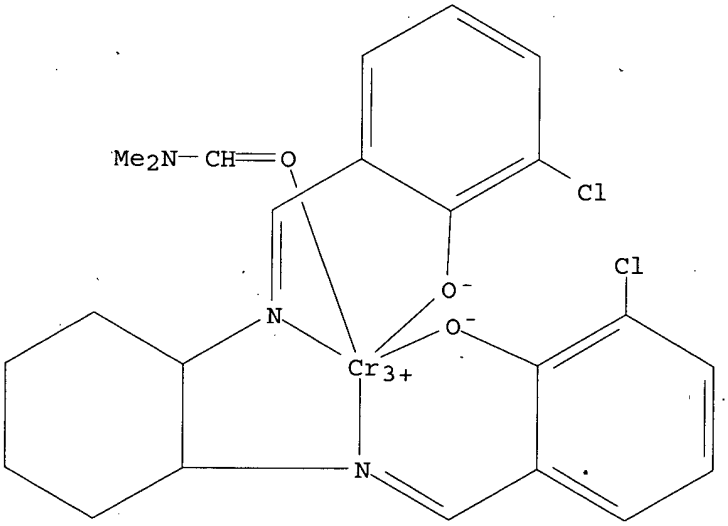
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181653-65-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

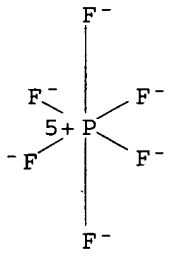
CM 1

CRN 181653-64-5
CMF C23 H25 Cl2 Cr N3 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

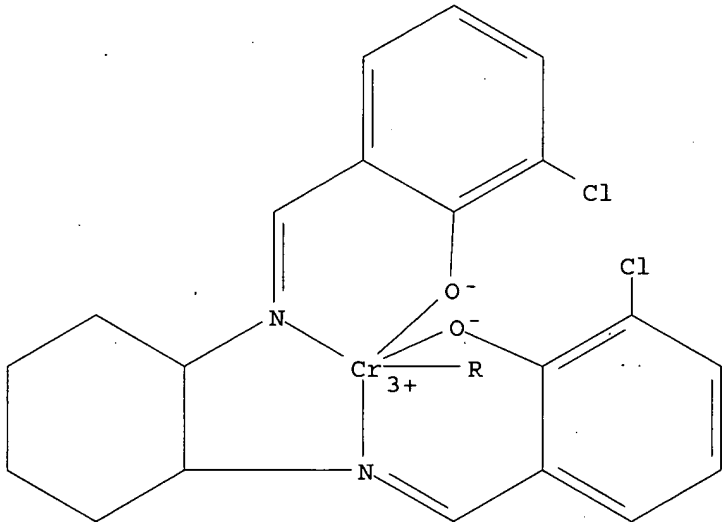


RN 181653-68-9 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[6-chlorophenolato]](2-)-N,N',O,O']pyridine 1-oxide-O)-, [SP-5-13-(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

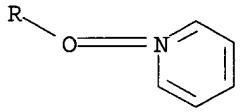
CM 1

CRN 181653-67-8
CMF C25 H23 Cl2 Cr N3 O3
CCI CCS

PAGE 1-A

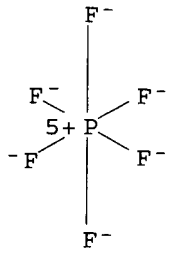


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

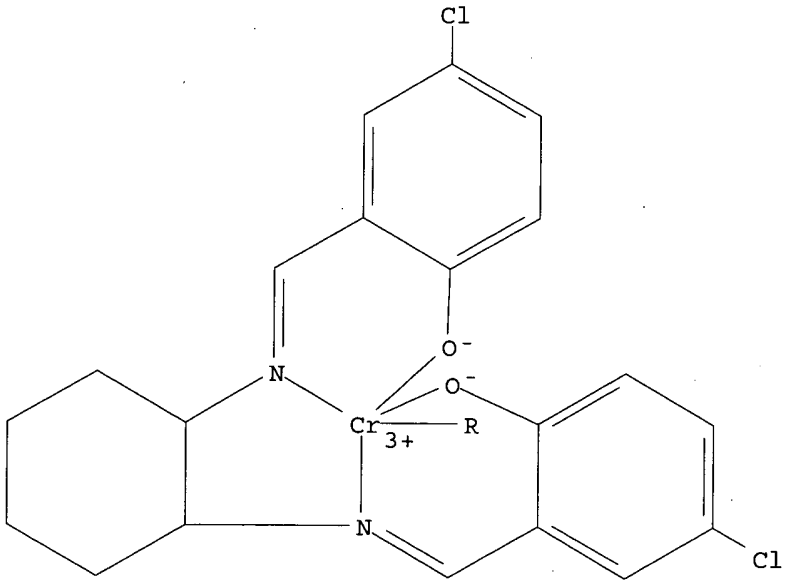


RN 181787-66-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][(4-methoxyphenyl)methylphenylphosphine oxide]-, [SP-5-13-1(R),2(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

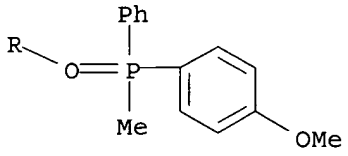
CM 1

CRN 181787-65-5
CMF C34 H33 Cl2 Cr N2 O4 P
CCI CCS

PAGE 1-A

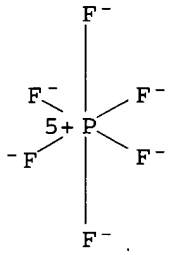


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

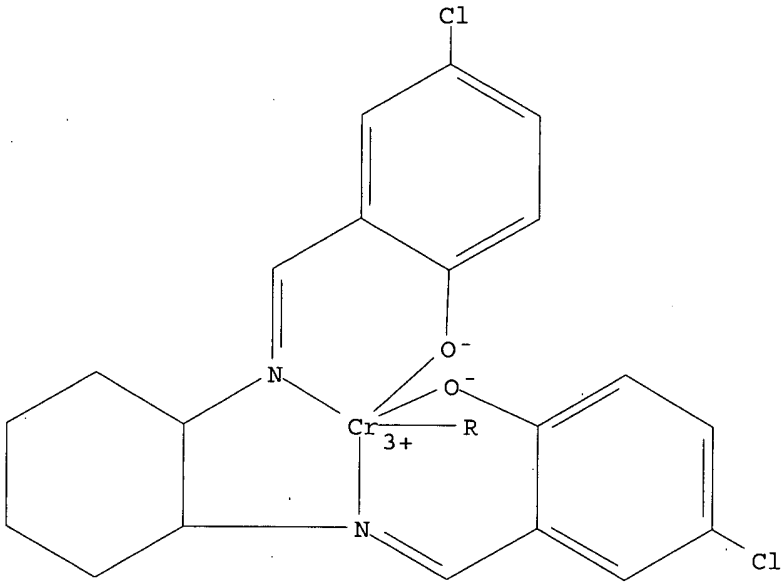


RN 181787-68-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][(4-methoxyphenyl)methylphenylphosphine oxide]-, [SP-5-13-1(S),2(1R-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

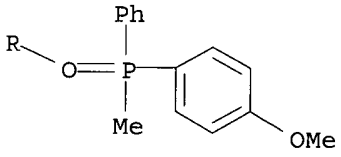
CM 1

CRN 181787-67-7
CMF C34 H33 Cl2 Cr N2 O4 P
CCI CCS

PAGE 1-A

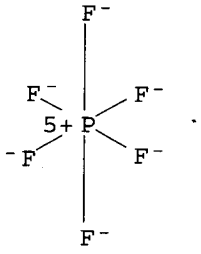


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

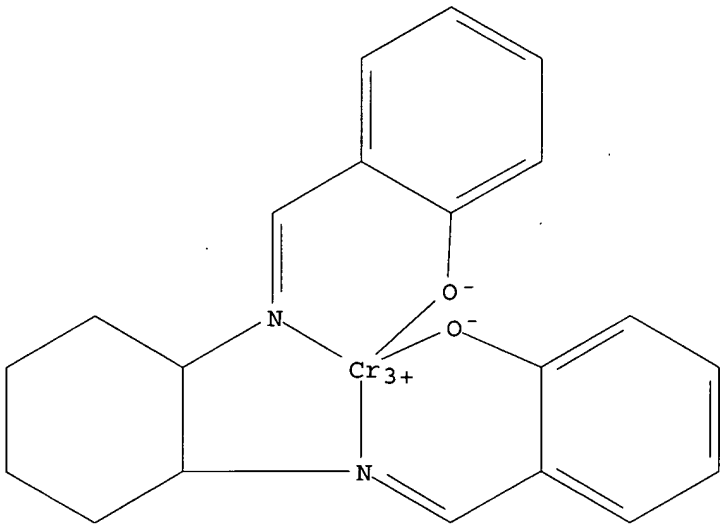


RN 181787-70-2 HCAPLUS

CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O']-, [SP-4-2-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

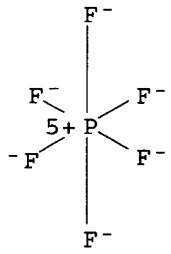
CM 1

CRN 181787-69-9
CMF C20 H20 Cr N2 O2
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

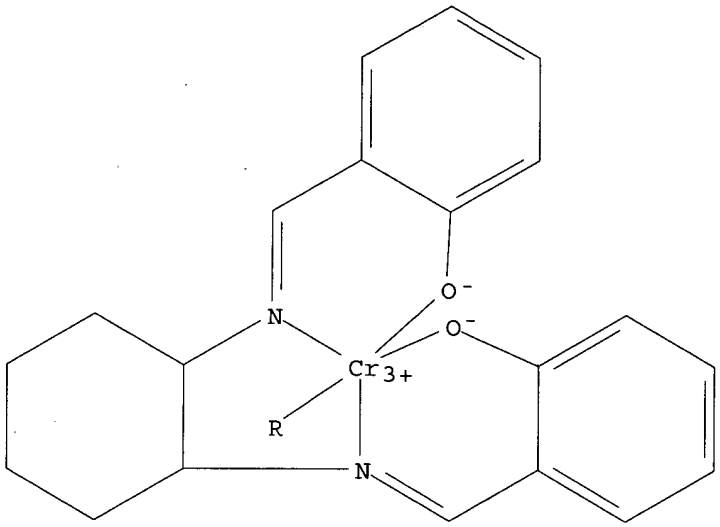


RN 181787-72-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'][sulfinylbis[methane]-O]-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

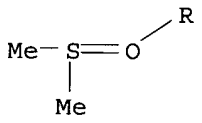
CM 1

CRN 181787-71-3
CMF C22 H26 Cr N2 O3 S
CCI CCS

PAGE 1-A

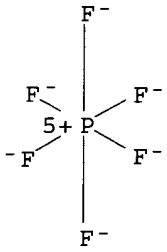


PAGE 2-A



CM 2

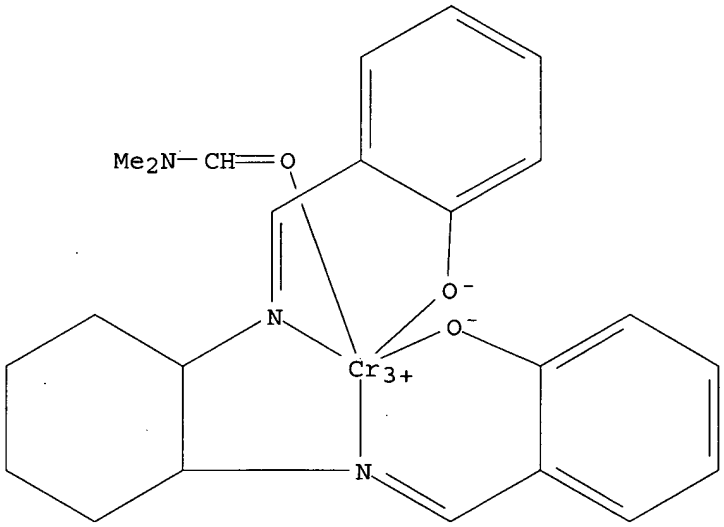
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181787-74-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

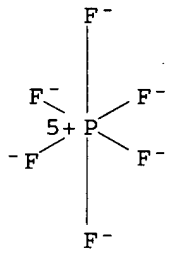
CM 1

CRN 181787-73-5
CMF C23 H27 Cr N3 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

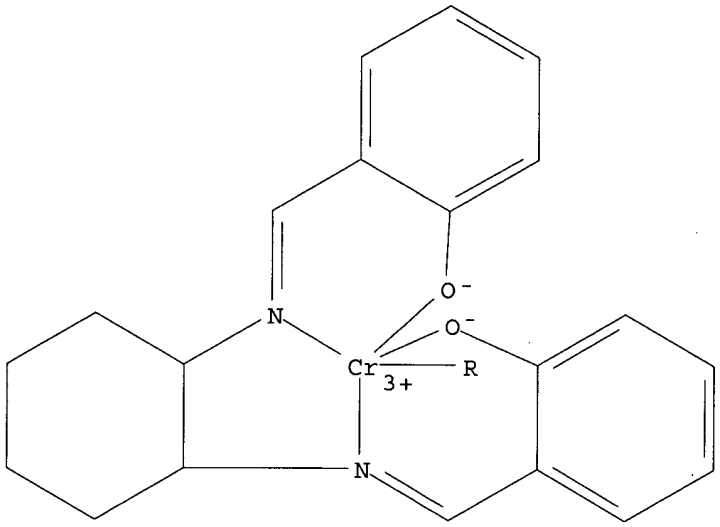


RN 181787-76-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O'](pyridine 1-oxide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

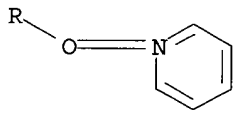
CM 1

CRN 181787-75-7
CMF C25 H25 Cr N3 O3
CCI CCS

PAGE 1-A

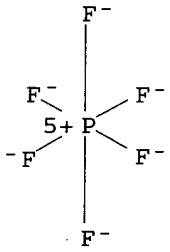


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

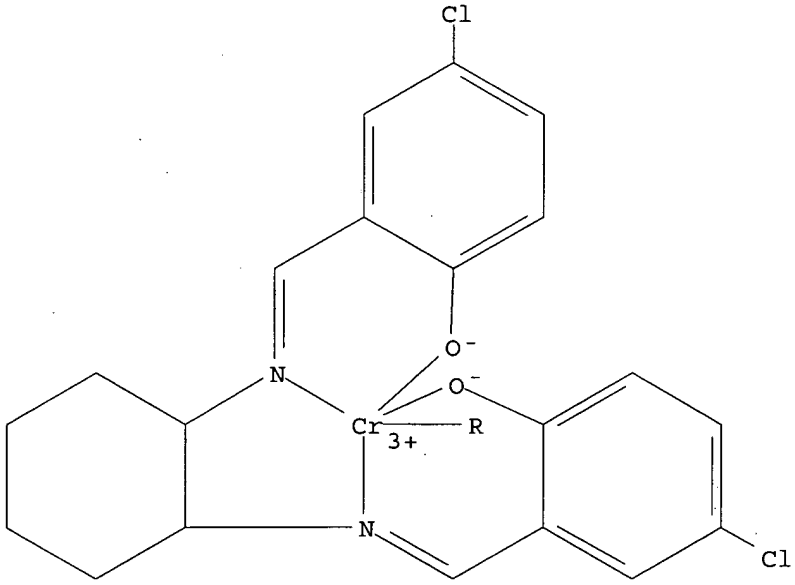


RN 181787-78-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][methyl(4-methylphenyl)phenylphosphine oxide-O]-, [SP-5-13-1(R),2(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

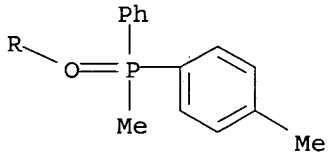
CM 1

CRN 181787-77-9
CMF C34 H33 Cl2 Cr N2 O3 P
CCI CCS

PAGE 1-A

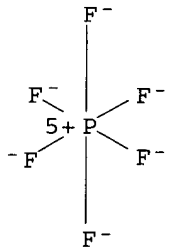


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

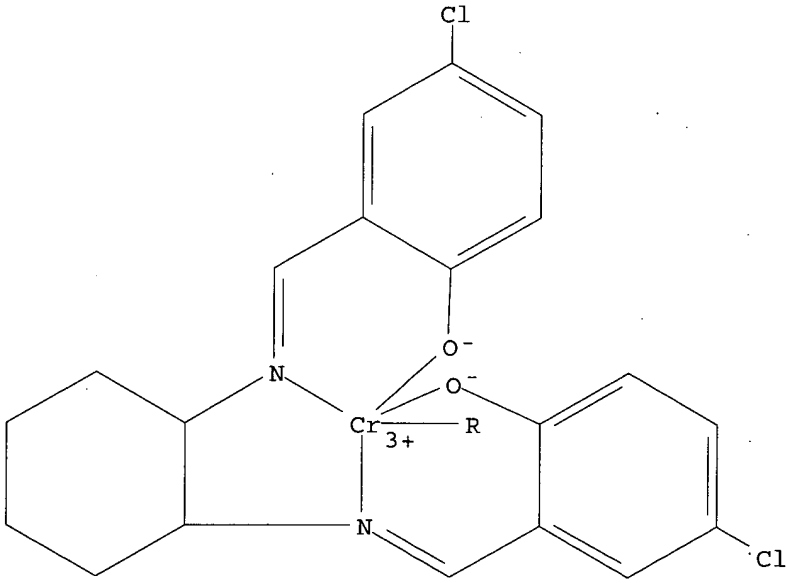


RN 181787-80-4 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'][methyl(4-methylphenyl)phenylphosphine oxide-O]-, [SP-5-13-1(S),2(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

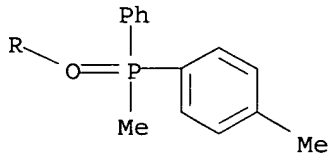
CM 1

CRN 181787-79-1
CMF C34 H33 Cl2 Cr N2 O3 P
CCI CCS

PAGE 1-A

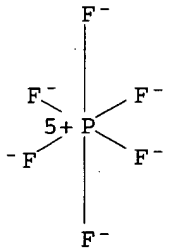


PAGE 2-A



CM 2

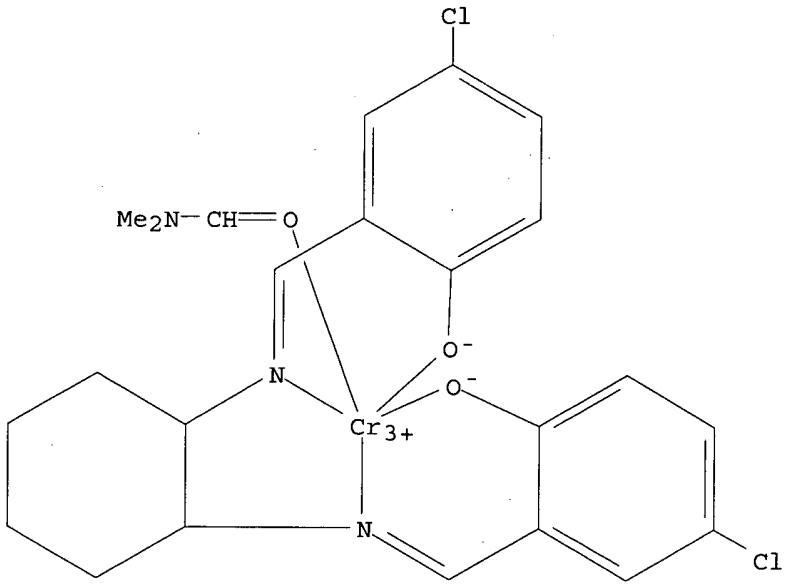
CRN 16919-18-9
CMF F6 P
CCI CCS



RN 181787-82-6 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'](N,N-dimethylformamide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

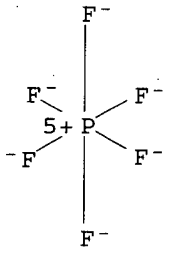
CM 1

CRN 181787-81-5
CMF C23 H25 Cl2 Cr N3 O3
CCI CCS



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

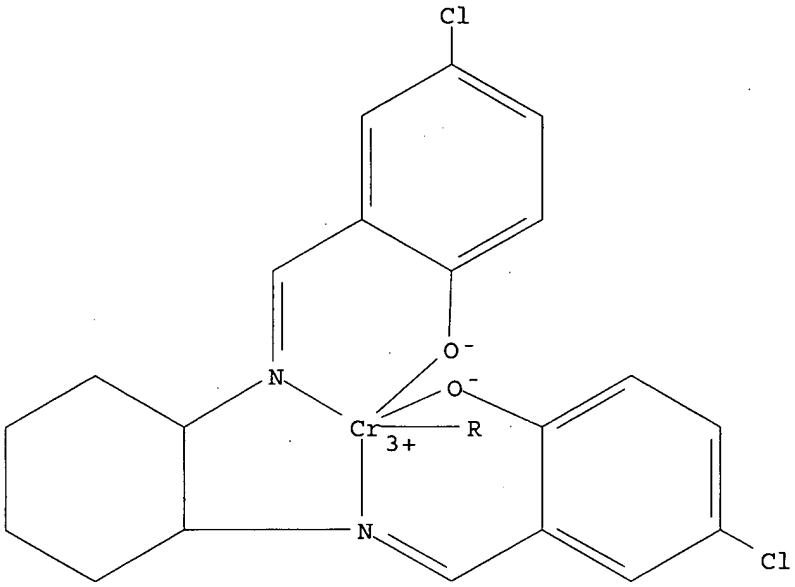


RN 181787-84-8 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4-chlorophenolato]](2-)-N,N',O,O'](4-phenylpyridine 1-oxide-O)-, [SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

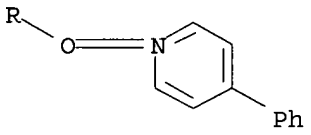
CM 1

CRN 181787-83-7
CMF C31 H27 Cl2 Cr N3 O3
CCI CCS

PAGE 1-A

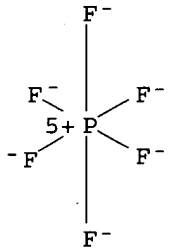


PAGE 2-A



CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

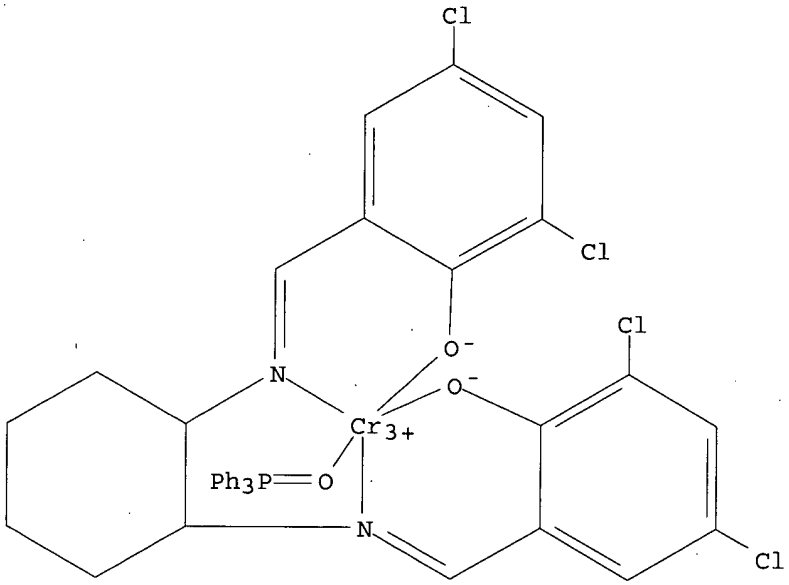


RN 181787-86-0 HCAPLUS
CN Chromium(1+), [[2,2'-[1,2-cyclohexanediylbis(nitrilomethylidyne)]bis[4,6-

dichlorophenolato]](2-)-N,N',O,O'](triphenylphosphine oxide-O)-,
[SP-5-13-(1S-trans)]-, hexafluorophosphate(1-) (9CI) (CA INDEX NAME)

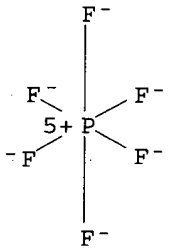
CM 1

CRN 181787-85-9
CMF C38 H31 Cl4 Cr N2 O3 P
CCI CCS



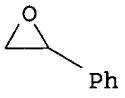
CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

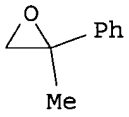


IT **96-09-3P**, Phenyl oxirane **2085-88-3P 4518-66-5P**
14212-53-4P 14212-54-5P 17619-97-5P
27415-21-0P 51410-46-9P
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation by catalytic epoxidn. of alkene in presence of chromium Schiff

base complexes)
RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)

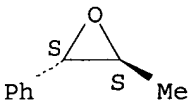


RN 2085-88-3 HCAPLUS
CN Oxirane, 2-methyl-2-phenyl- (9CI) (CA INDEX NAME)



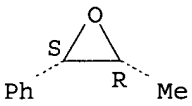
RN 4518-66-5 HCAPLUS
CN Oxirane, 2-methyl-3-phenyl-, (2S,3S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



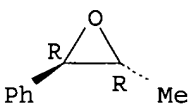
RN 14212-53-4 HCAPLUS
CN Oxirane, 2-methyl-3-phenyl-, (2R,3S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



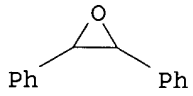
RN 14212-54-5 HCAPLUS
CN Oxirane, 2-methyl-3-phenyl-, (2R,3R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).

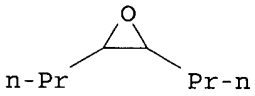


RN 17619-97-5 HCAPLUS

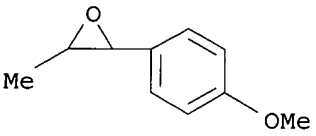
CN Oxirane, 2,3-diphenyl- (9CI) (CA INDEX NAME)



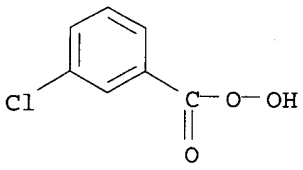
RN 27415-21-0 HCAPLUS
CN Oxirane, 2,3-dipropyl- (9CI) (CA INDEX NAME)



RN 51410-46-9 HCAPLUS
CN Oxirane, 2-(4-methoxyphenyl)-3-methyl- (9CI) (CA INDEX NAME)



IT **937-14-4**, m-Chloroperbenzoic acid
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reactant for catalytic epoxidn. of alkenes in presence of transition metal Schiff base complexes with neutral donor ligands)
RN 937-14-4 HCAPLUS
CN Benzenecarboperoxoic acid, 3-chloro- (9CI) (CA INDEX NAME)



L49 ANSWER 18 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1995:964985 HCAPLUS
DOCUMENT NUMBER: 124:145879
TITLE: Integrated process for epoxide production involving autoxidation of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidation
INVENTOR(S): Rodriguez, Carmen L.; Zajacek, John G.
PATENT ASSIGNEE(S): Arco Chemical Technology, L.P., USA
SOURCE: U.S., 9 pp.

CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5463090	A	19951031	US 1994-330057	19941027
EP 709339	A1	19960501	EP 1995-306862	19950928
EP 709339	B1	19990428		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE				
AT 179396	E	19990515	AT 1995-306862	19950928
ES 2130540	T3	19990701	ES 1995-306862	19950928

PRIORITY APPLN. INFO.: US 1994-313969 A 19940928
US 1994-330057 A 19941027
OTHER SOURCE(S): CASREACT 124:145879; MARPAT 124:145879

AB Epoxides are produced by an integrated process involving mol. oxygen oxidation of an alkylammonium salt of a sulfonic acid-substituted anthrahydroquinone, epoxidn. of an ethylenically unsatd. substrate using the hydrogen peroxide-containing product obtained by such oxidation in the presence of a titanium silicalite catalyst, and regeneration of the anthrahydroquinone by hydrogenation of the anthraquinone co-product. Oxidation and epoxidn. may be performed concurrently. The alkylammonium salts have the advantage of being highly soluble in polar protic media such as water and lower alcs.

IC ICM C07D301-12
ICS C07D303-04
INCL 549531000
CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 35, 45
IT **Epoxidation**
Epoxidation catalysts
Hydrogenation
Hydrogenation catalysts
Oxidation, aut-
(integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(hydrogenation catalyst; integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
IT **7722-84-1P**, Hydrogen peroxide, preparation
RL: IMF (Industrial manufacture); **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(in situ formation; integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
IT **75-56-9P**, preparation **556-52-5P**, Glycidol
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
IT **107-18-6**, 2-Propen-1-ol, reactions **115-07-1**, 1-Propene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**

(integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)

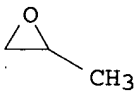
IT **7440-47-3**, Chromium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(hydrogenation catalyst; integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

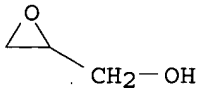
IT **7722-84-1P**, Hydrogen peroxide, preparation
RL: IMF (Industrial manufacture); **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(in situ formation; integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)

HO—OH

IT **75-56-9P**, preparation **556-52-5P**, Glycidol
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); **PREP (Preparation)**
(integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)

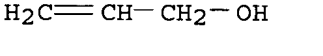


RN 556-52-5 HCAPLUS
CN Oxiranemethanol (9CI) (CA INDEX NAME)

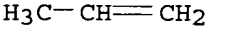


IT **107-18-6**, 2-Propen-1-ol, reactions **115-07-1**, 1-Propene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(integrated process for epoxide production involving autoxidn. of alkylammonium anthrahydroquinonesulfonate coupled with alkene epoxidn.)

RN 107-18-6 HCAPLUS
CN 2-Propen-1-ol (9CI) (CA INDEX NAME)



RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



L49 ANSWER 19 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1990:101183 HCAPLUS
DOCUMENT NUMBER: 112:101183
TITLE: Polyoxometalates substituted with transition metals as homogeneous catalysts for hydroxylation and epoxidation
INVENTOR(S): Hill, Craig L.
PATENT ASSIGNEE(S): Emory University, USA
SOURCE: U.S., 13 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4864041	A	19890905	US 1987-10682	19870204
PRIORITY APPLN. INFO.:			US 1987-10682	19870204

OTHER SOURCE(S): CASREACT 112:101183
AB The title catalysts, with good stability in air and resistance to degradation, catalyze the hydroxylation of alkanes and the epoxidn. of alkenes by O donors.. Stirring .apprx.50 mg of (MnPW11O39)(H)(NBu4)4 and 0.6 mL cyclohexane in 5 mL MeCN at 65° while adding 20 μL tert-BuOOH and stirring 24 h gave a 27% yield of cyclohexanone-cyclohexanol.
IC C07C030-03
INCL 549513000
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 27, 67
IT **Epoxidation catalysts**
(transition metal heteropoly acid salts, for alkenes)
IT 7439-89-6D, Iron, heteropolyacid salts 7440-02-0D, Nickel, heteropolyacid salts 7440-05-3D, Palladium, heteropolyacid salts 7440-15-5D, Rhenium, heteropolyacid salts 7440-16-6D, Rhodium, heteropolyacid salts 7440-17-7D, Rubidium, heteropolyacid salts 7440-22-4D, Silver, heteropolyacid salts 7440-26-8D, Technetium, heteropolyacid salts 7440-48-4D, Cobalt, heteropolyacid salts 7440-50-8D, Copper, heteropolyacid salts 99810-80-7 99810-81-8 99810-83-0 **125483-12-7** 125483-13-8
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for hydroxylation of alkanes or epoxidn. of alkenes)
IT 110-83-8, Cyclohexene, reactions 498-66-8, Bicyclo[2.2.1]hept-2-ene

592-41-6, 1-Hexene, reactions 931-88-4, Cyclooctene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, catalysts for)

IT **7722-84-1**, Hydrogen peroxide, uses and miscellaneous 14353-90-3, Pentafluoroiodosylbenzene
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(hydroxylation by, of alkanes, catalysts for)

IT 591-78-6P, 2-Hexanone 626-93-7P, 2-Hexanol **1436-34-6P**, 1-Hexene oxide
RL: **PREP (Preparation)**
(manufacture of, from hexene, catalysts for)

IT **125483-12-7**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for hydroxylation of alkanes or epoxidn. of alkenes)

RN 125483-12-7 HCAPLUS

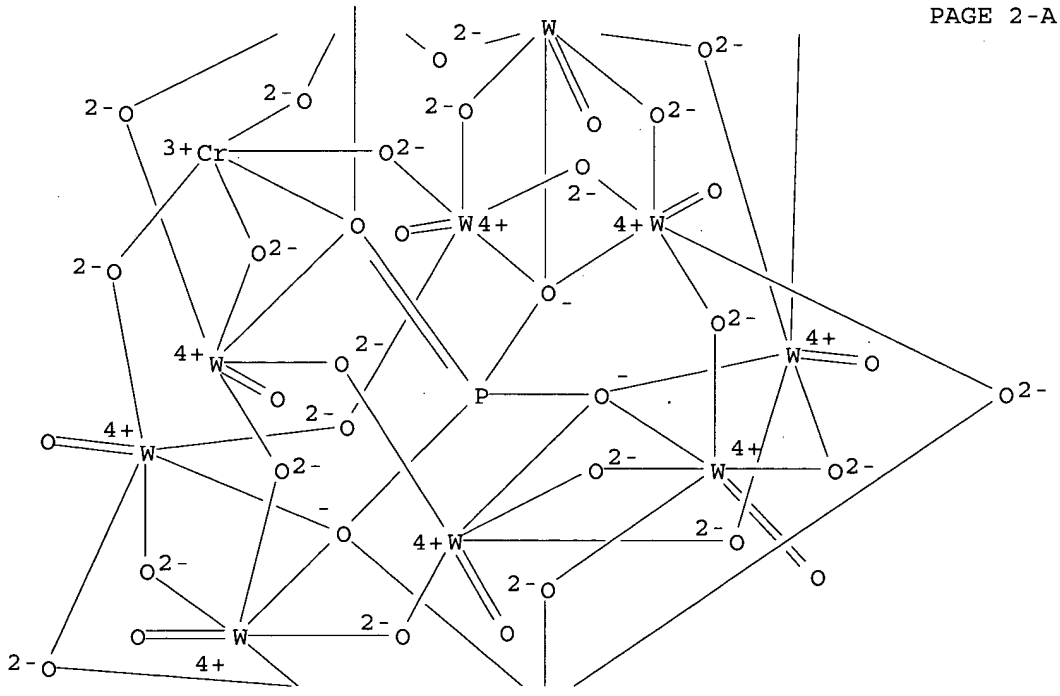
CN 1-Butanaminium, N,N,N-tributyl-, chromatetetracosa-μ-oxoundecaoxo[μ12-[phosphato(3-)-O:O:O:O':O':O':O'':O'':O'':O''':O''':O''']]undecatungstate(4-) (4:1) (9CI) (CA INDEX NAME)

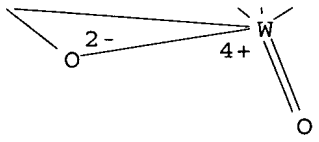
CM 1

CRN 123183-37-9
CMF Cr O39 P W11
CCI CCS

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

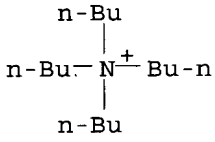
PAGE 2-A



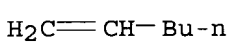


CM 2

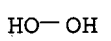
CRN 10549-76-5
CMF C16 H36 N



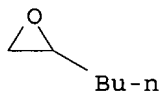
IT **592-41-6**, 1-Hexene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, catalysts for)
RN 592-41-6 HCAPLUS
CN 1-Hexene (8CI, 9CI) (CA INDEX NAME)



IT **7722-84-1**, Hydrogen peroxide, uses and miscellaneous
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(hydroxylation by, of alkanes, catalysts for)
RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)



IT **1436-34-6P**, 1-Hexene oxide
RL: **PREP (Preparation)**
(manufacture of, from hexene, catalysts for)
RN 1436-34-6 HCAPLUS
CN Oxirane, butyl- (9CI) (CA INDEX NAME)



L49 ANSWER 20 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1989:553028 HCAPLUS
DOCUMENT NUMBER: 111:153028
TITLE: Reactivity-structure correlations in oxidation with metalloporphyrins
AUTHOR(S): Haber, Jerzy; Mlodnicka, Teresa; Witko, Malgorzata
CORPORATE SOURCE: Inst. Catal. Surface Chem., Pol. Acad. Sci., Cracow, Pol.
SOURCE: Journal of Molecular Catalysis (1989), 52(1), 85-97
CODEN: JMCADS; ISSN: 0304-5102
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Metalloporphyrins of the 1st transition series were studied as catalysts in the oxidation of propene by dioxygen in Et acetate in the presence of propionaldehyde. With MnIIITTP and FeIIITTP of low redox potential, the reaction starts with generation of an acyl radical by electron transfer to a metal orbital, followed by formation of a peroxy acid. In the case of CoIITTP, acyl radicals are generated through abstraction of hydrogen by the ready formed CoIITTP-O2, complex. Co-porphyrin binds the peroxy acid in 2 ways: through the oxygen of the carbonyl group with the peroxy oxygen atoms sticking out, or through the peroxy oxygen with the double-bonded oxygen of the carbonyl group exposed. Quantum chemical calcns. revealed that only the terminal oxygen of the exposed peroxy group in the 1st type of complex acquires electrophilic properties and can add an oxygen atom to the olefinic double bond. Such a complex of MnIII-porphyrin is unstable and decomps. to form manganese oxo species which are responsible for epoxidn. MnIII-porphyrin also shows high activity in the homolytic decomposition of the peroxy acid with evolution of CO2. In the case of Cr(III), Ni(II), Cu(II) and Zn(II) porphyrins, the reduction potential is too high to allow electron transfer from aldehyde to the metal center, rendering the 1st step of the reaction difficult.

CC 22-7 (Physical Organic Chemistry)
Section cross-reference(s): 26, 78

IT **Epoxidation**
Oxidation
(of propene, mechanism of metalloporphyrin-catalyzed)

IT 19414-66-5 19414-67-6 **43145-39-7** 58188-46-8
RL: **CAT (Catalyst use)**; USES (Uses)
(catalytic activity of, in oxidation of propene)

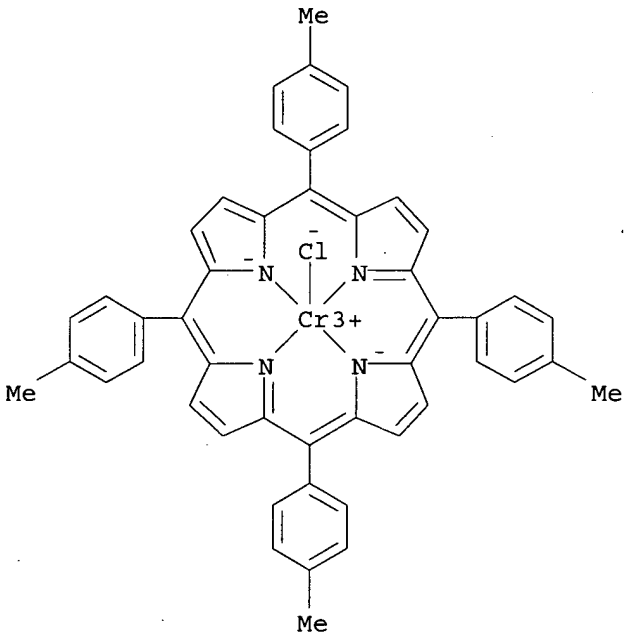
IT **4212-43-5P**, Peroxypropionic acid
RL: **RCT (Reactant)**; PREP (Preparation); **RACT (Reactant or reagent)**
(formation and reactions of, in catalytic propene oxidation)

IT **75-56-9P**, preparation
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, by propene oxidation mechanism of catalytic)

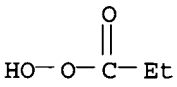
IT **115-07-1**, 1-Propene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(oxidation of, mechanism of metalloporphyrin-catalyzed)

IT **43145-39-7**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalytic activity of, in oxidation of propene)

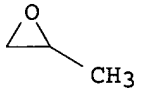
RN 43145-39-7 HCAPLUS
CN Chromium, chloro[5,10,15,20-tetrakis(4-methylphenyl)-21H,23H-porphinato(2-)-κN21,κN22,κN23,κN24]-, (SP-5-12)- (9CI) (CA INDEX NAME)



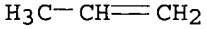
IT **4212-43-5P**, Peroxypropionic acid
RL: **RCT (Reactant)**; PREP (Preparation); **RACT (Reactant or reagent)**
(formation and reactions of, in catalytic propene oxidation)
RN 4212-43-5 HCAPLUS
CN Propaneperoxoic acid (9CI) (CA INDEX NAME)



IT **75-56-9P**, preparation
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, by propene oxidation mechanism of catalytic)
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



IT **115-07-1**, 1-Propene, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(oxidation of, mechanism of metalloporphyrin-catalyzed)
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



L49 ANSWER 21 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1986:442569 HCAPLUS
DOCUMENT NUMBER: 105:42569
TITLE: Metalloporphyrin-catalyzed epoxidation of terminal aliphatic olefins with hypochlorite salts or potassium hydrogen persulfate
AUTHOR(S): De Poorter, Bertha; Meunier, Bernard
CORPORATE SOURCE: Lab. Chim. Coord., Toulouse, 31400, Fr.
SOURCE: Journal of the Chemical Society, Perkin Transactions 2: Physical Organic Chemistry (1972-1999) (1985), (11), 1735-40
CODEN: JCPKBH; ISSN: 0300-9580
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 105:42569

AB Substitution of tetraphenylporphyrinatomanganese(III) complexes on the peripheral Ph groups makes these compds. suitable as catalysts for the epoxidn. of terminal olefins with monooxygen donors such as NaOCl, LiOCl, and KHSO5 in a biphasic system.

CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 23

IT **Epoxidation catalysts**
(metalloporphyrins, for alkenes by hypochlorite salts or potassium hydrogen persulfate)

IT **Epoxidation**
(of alkenes, by hypochlorite salts or potassium hydrogen persulfate)

IT 16456-81-8 **28110-70-5** 58356-65-3 60250-84-2 79968-43-7 85939-49-7 91463-17-1 91535-98-7 91584-52-0 97330-51-3
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for epoxidn. of alkenes by hypochlorite salts or potassium hydrogen persulfate)

IT 7681-52-9 **10058-23-8**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. by, of alkenes, metalloporphyrin-catalyzed)

IT **111-66-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by hypochlorite salts or potassium hydrogen persulfate, metalloporphyrin-catalyzed)

IT **100-42-5**, reactions 110-83-8, reactions 591-49-1
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by potassium hydrogen persulfate, metalloporphyrin-catalyzed)

IT **1119-51-3** **1576-85-8**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by sodium hypochlorite or potassium hydrogen persulfate, metalloporphyrin-catalyzed)

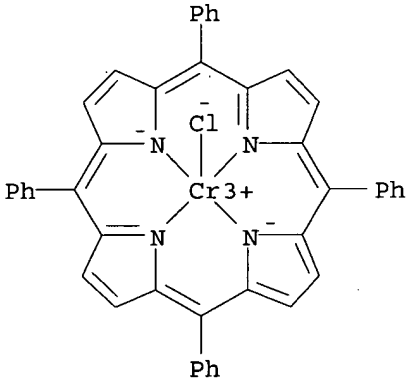
IT **115-07-1**, reactions **695-12-5**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by sodium hypochlorite, metalloporphyrin-catalyzed)

IT **75-56-9P**, preparation **96-09-3P** 286-20-4P 1713-33-3P **2984-50-1P** **3483-39-4P** **21746-87-2P** **59287-65-9P**

RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by metalloporphyrin-catalyzed epoxidn. of alkene)

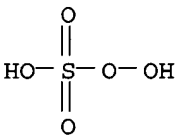
IT **28110-70-5**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for epoxidn. of alkenes by hypochlorite salts or potassium hydrogen persulfate)

RN 28110-70-5 HCAPLUS
CN Chromium, chloro[5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-κN21,κN22,κN23,κN24]-, (SP-5-12)- (9CI) (CA INDEX NAME)



IT **10058-23-8**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. by, of alkenes, metalloporphyrin-catalyzed)

RN 10058-23-8 HCAPLUS
CN Peroxymonosulfuric acid, monopotassium salt (8CI, 9CI) (CA INDEX NAME)



● K

IT **111-66-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by hypochlorite salts or potassium hydrogen persulfate, metalloporphyrin-catalyzed)

RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)

$H_2C{=}CH{-}(CH_2)_5{-}Me$

IT **100-42-5**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by potassium hydrogen persulfate, metalloporphyrin-catalyzed)
RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)

$H_2C{=}CH{-}Ph$

IT **1119-51-3 1576-85-8**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by sodium hypochlorite or potassium hydrogen persulfate, metalloporphyrin-catalyzed)
RN 1119-51-3 HCAPLUS
CN 1-Pentene, 5-bromo- (6CI, 8CI, 9CI) (CA INDEX NAME)

$H_2C{=}CH{-}(CH_2)_3{-}Br$

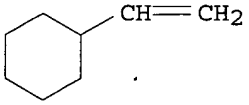
RN 1576-85-8 HCAPLUS
CN 4-Penten-1-ol, acetate (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

$H_2C{=}CH{-}(CH_2)_3{-}OAc$

IT **115-07-1**, reactions **695-12-5**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by sodium hypochlorite, metalloporphyrin-catalyzed)
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)

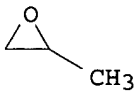
$H_3C{-}CH{=}CH_2$

RN 695-12-5 HCAPLUS
CN Cyclohexane, ethenyl- (9CI) (CA INDEX NAME)

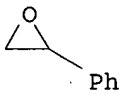


IT **75-56-9P**, preparation **96-09-3P 2984-50-1P**
3483-39-4P 21746-87-2P 59287-65-9P
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by metalloporphyrin-catalyzed epoxidn. of alkene)

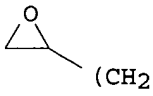
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



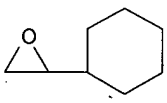
RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)



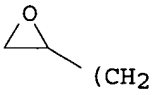
RN 2984-50-1 HCAPLUS
CN Oxirane, hexyl- (9CI) (CA INDEX NAME)



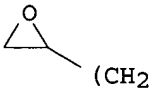
RN 3483-39-4 HCAPLUS
CN Oxirane, cyclohexyl- (9CI) (CA INDEX NAME)



RN 21746-87-2 HCAPLUS
CN Oxirane, (3-bromopropyl)- (9CI) (CA INDEX NAME)



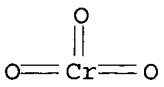
RN 59287-65-9 HCAPLUS
CN Oxiranepropanol, acetate (9CI) (CA INDEX NAME)



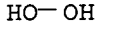
L49 ANSWER 22 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1984:454810 HCAPLUS
DOCUMENT NUMBER: 101:54810
TITLE: Epoxidation of alkenes with hydrogen peroxide in the presence of molybdenum oxide-tributyltin chloride on charcoal catalysts
AUTHOR(S): Itoi, Yasushi; Inoue, Masami; Enomoto, Saburo; Watanabe, Yoshihiro
CORPORATE SOURCE: Fac. Pharm. Sci., Toyama Med. Pharm. Univ., Toyama, 930-01, Japan
SOURCE: Chemical & Pharmaceutical Bulletin (1984), 32(2), 418-23
CODEN: CPBTAL; ISSN: 0009-2363
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Molybdenum oxide fixed on active charcoal in the form of molybdenum blue catalyzed epoxidn. of alkenes (cyclopentene, cyclohexene, methylcyclohexene, styrene, methylstyrene, octene, decene) with aqueous H2O2 (30%) in Me2CHOH. The yields increased in the presence of organotin compds. Among them, Bu3SnCl gave good yields; cyclopentene and cyclohexene were epoxidized in yields of 71 and 60%, resp. The catalyst could be separated by filtration and used repeatedly. By adjusting the pH value of the charcoal support with acid or base, both the epoxide yield and the selectivity could be varied widely, and good results were obtained between pH 6 and 7.

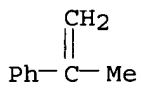
CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
IT **Epoxidation catalysts**
(molybdenum oxide-tributyltin chloride on charcoal, for alkenes)
IT **1333-82-0**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for oxidation of cyclohexene to cyclohexenone)
IT **7722-84-1**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. by, of alkenes, molybdenum oxide-tributyltin chloride catalyst for)
IT **98-83-9**, reactions **100-42-5**, reactions 110-83-8, reactions **111-66-0** 142-29-0 591-49-1 **872-05-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by hydrogen peroxide, catalyst for)
IT **96-09-3P** 285-67-6P 1713-33-3P **2085-88-3P** **2404-44-6P** **2984-50-1P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of alkene by hydrogen peroxide in presence of molybdenum-tin catalyst on charcoal)
IT **1333-82-0**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for oxidation of cyclohexene to cyclohexenone)
RN 1333-82-0 HCAPLUS
CN Chromium oxide (CrO3) (8CI, 9CI) (CA INDEX NAME)



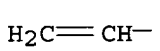
IT **7722-84-1**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. by, of alkenes, molybdenum oxide-tributyltin chloride catalyst for)
RN 7722-84-1 HCAPLUS
CN Hydrogen peroxide (H2O2) (9CI) (CA INDEX NAME)



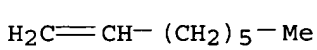
IT **98-83-9**, reactions **100-42-5**, reactions **111-66-0** **872-05-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by hydrogen peroxide, catalyst for)
RN 98-83-9 HCAPLUS
CN Benzene, (1-methylethenyl)- (9CI) (CA INDEX NAME)



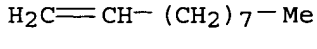
RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)



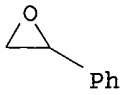
RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)



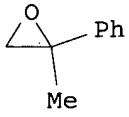
RN 872-05-9 HCAPLUS
CN 1-Decene (8CI, 9CI) (CA INDEX NAME)



IT **96-09-3P 2085-88-3P 2404-44-6P** **2984-50-1P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of alkene by hydrogen peroxide in presence of molybdenum-tin catalyst on charcoal)
RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)



RN 2085-88-3 HCAPLUS
CN Oxirane, 2-methyl-2-phenyl- (9CI) (CA INDEX NAME)



RN 2404-44-6 HCAPLUS
CN Oxirane, octyl- (9CI) (CA INDEX NAME)

RN 2984-50-1 HCAPLUS
CN Oxirane, hexyl- (9CI) (CA INDEX NAME)

L49 ANSWER 23 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1983:215231 HCAPLUS
DOCUMENT NUMBER: 98:215231
TITLE: Studies on styrene epoxidation with organic hydroperoxides
AUTHOR(S): Spadlo, Marian
CORPORATE SOURCE: Inst. Ciezkiej Synt. Org., Kedzierzyn-Kozle, Pol.
SOURCE: Chemia Stosowana (1982), 26(1), 111-7
CODEN: CHSWAP; ISSN: 0376-0898
DOCUMENT TYPE: Journal
LANGUAGE: Polish

AB Liquid phase epoxidn. of styrene by cumene hydroperoxide in the presence of catalysts containing salts of Co, Mn, Ni, Cr, Mo, V, W, Ti, Zr, Rh, and Tl confirmed that if the Mo catalysts are soluble in the reaction mixture the highest conversion (89-94%) of the hydroperoxide and the highest selectivity (71-83%) to styrene oxide is obtained. Among other hydroperoxides Me3COOH was most effective and as a polymerization inhibitor hydroquinone was most effective.

CC 25-2 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
IT **Epoxidation catalysts**
(transition metal salts, for styrene by hydroperoxides)

IT 3153-26-2 7439-98-7D, naphthenate derivative, uses and miscellaneous
7440-47-3D, naphthenate derivative, uses and miscellaneous
10585-24-7 13476-99-8 13939-06-5 14040-11-0 14219-90-0
14284-89-0 14284-90-3 14694-95-2 17185-29-4 17524-05-9
21679-46-9 23519-77-9 50412-10-7
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for epoxidn. of styrene by hydroperoxides)

IT **75-91-2 80-15-9 3071-32-7 18428-18-7**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. by, of styrene in presence of transition metal salts)

IT **100-42-5**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by hydroperoxides in presence of transition metal salts)

IT **96-09-3P**
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, in epoxidn. of styrene by hydroperoxides in presence of transition metal salts)

IT **7440-47-3D**, naphthenate derivative, uses and miscellaneous
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for epoxidn. of styrene by hydroperoxides)

RN 7440-47-3 HCAPLUS
CN Chromium (8CI, 9CI) (CA INDEX NAME)

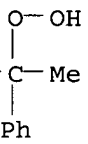
Cr

IT **75-91-2 80-15-9 3071-32-7 18428-18-7**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. by, of styrene in presence of transition metal salts)

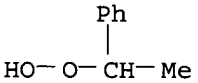
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)

HO—O—Bu-t

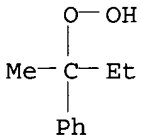
RN 80-15-9 HCAPLUS
CN Hydroperoxide, 1-methyl-1-phenylethyl (9CI) (CA INDEX NAME)



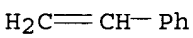
RN 3071-32-7 HCAPLUS
CN Hydroperoxide, 1-phenylethyl (9CI) (CA INDEX NAME)



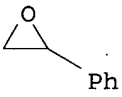
RN 18428-18-7 HCAPLUS
CN Hydroperoxide, 1-methyl-1-phenylpropyl (9CI) (CA INDEX NAME)



IT **100-42-5**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, by hydroperoxides in presence of transition metal salts)
RN 100-42-5 HCAPLUS
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)



IT **96-09-3P**
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, in epoxidn. of styrene by hydroperoxides in presence of transition metal salts)
RN 96-09-3 HCAPLUS
CN Oxirane, phenyl- (9CI) (CA INDEX NAME)



L49 ANSWER 24 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1981:407594 HCAPLUS
DOCUMENT NUMBER: 95:7594
TITLE: Metal ion-catalyzed oxidation of steroids. Part XIII. The reactions of cholesteryl acetate with tert-butyl hydroperoxide and molybdenum complexes
AUTHOR(S): Kimura, Michiya; Muto, Toshiki
CORPORATE SOURCE: Fac. Pharm. Sci., Hokkaido Univ., Sapporo, 060, Japan
SOURCE: Chemical & Pharmaceutical Bulletin (1981), 29(1), 35-42
CODEN: CPBTAL; ISSN: 0009-2363
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Epoxidn. and allylic oxidation of cholesteryl acetate were studied with Me3COOH in the presence Mo complexes. MoO2(acac)2 (acac = acetylacetonate) facilitated the formation of an epoxide as well as its further conversion to the B-nor-5-carboxaldehyde. Since similar results were obtained in the presence of Mo(CO)6 or MoCl5, the effect seems to be independent of the valency and the ligand of the molybdenum catalyst. Reactions using Mo(CO)6 were carried out in various solvents, and epoxidn.

or allylic oxidation occurred almost exclusively in C6H6 or in Me3OH, resp. The reaction proceeds by a radical mechanism in Me3OH but not in C6H6. In acetonitrile homolytic and heterolytic decomposition of Me3COOH occur simultaneously.

CC 32-6 (Steroids)

IT **Epoxidation catalysts**
Oxidation catalysts
(molybdenum complexes, for cholesteryl acetate by tert-Bu hydroperoxide)

IT 3153-26-2 3264-82-2 14024-18-1 14024-48-7 14024-58-9 14024-64-7 14284-89-0 15653-01-7 17524-05-9 **21679-31-2** 21679-46-9 46369-53-3
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for epoxidn.-oxidation of cholesteryl acetate by tert-Bu hydroperoxide)

IT **1439-07-2P 1689-71-0P**
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, by molybdenum-catalyzed tert-Bu peroxide epoxidn. of stilbene)

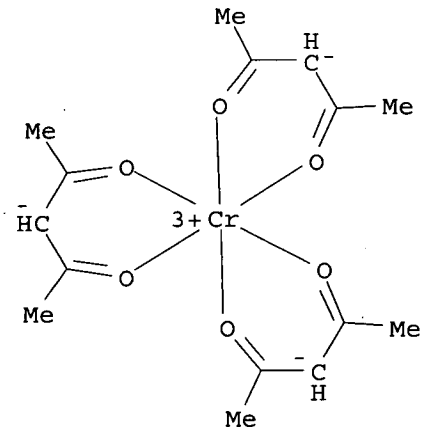
IT **103-30-0 645-49-8**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(molybdenum-catalyzed tert-Bu hydroperoxide oxidation of)

IT **75-91-2**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(oxidation and epoxidn. by, of cholesteryl acetate)

IT **21679-31-2**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for epoxidn.-oxidation of cholesteryl acetate by tert-Bu hydroperoxide)

RN 21679-31-2 HCAPLUS

CN Chromium, tris(2,4-pentanedionato-κO,κO')-, (OC-6-11)- (9CI) (CA INDEX NAME)

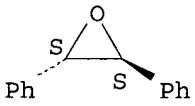


IT **1439-07-2P 1689-71-0P**
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, by molybdenum-catalyzed tert-Bu peroxide epoxidn. of stilbene)

RN 1439-07-2 HCAPLUS

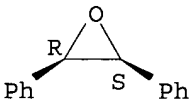
CN Oxirane, 2,3-diphenyl-, (2R,3R)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



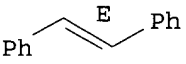
RN 1689-71-0 HCAPLUS
CN Oxirane, 2,3-diphenyl-, (2R,3S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



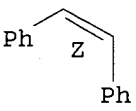
IT **103-30-0 645-49-8**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(molybdenum-catalyzed tert-Bu hydroperoxide oxidation of)
RN 103-30-0 HCAPLUS
CN Benzene, 1,1'-(1E)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



RN 645-49-8 HCAPLUS
CN Benzene, 1,1'-(1Z)-1,2-ethenediylbis- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT **75-91-2**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(oxidation and epoxidn. by, of cholesteryl acetate)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)

HO—O—Bu-t

L49 ANSWER 25 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1978:510759 HCAPLUS
DOCUMENT NUMBER: 89:110759
TITLE: Decomposition of hydroperoxides in propylene epoxidation reaction product
INVENTOR(S): Coyle, James J.
PATENT ASSIGNEE(S): Shell Oil Co., USA
SOURCE: U.S., 7 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

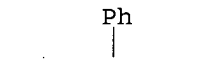
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4059598	A	19771122	US 1973-387849	19730813
BR 7406434	A0	19750527	BR 1974-6434	19740806
PRIORITY APPLN. INFO.:			US 1970-102971 A2	19701230
			US 1973-384857 A1	19730802
			US 1973-387849 A	19730813

AB In the epoxidn. of propylene [115-07-1] with an organic hydroperoxide in the presence of a heterogeneous catalyst, decomposition of residual hydroperoxides is effected by contact of the reaction product mixture at elevated temperature and pressure with a heterogeneous Co oxide catalyst optionally containing Cu oxide promoter. The hydroperoxide is thereby decomposed to the corresponding alc. without significant loss of propylene oxide (II) [75-56-9] or production of undesirable contaminants. Thus, an effluent stream from epoxidn. of I comprising I, II, MeCOPh, PhCH(Me)OH, PhEt, and ethylbenzene hydroperoxide (III) [27254-37-1] was contacted with Co oxide at 100° and liquid hourly space velocity 12 h-1. This treatment decomposed .apprx.99.7% of the III, and after 73 h the loss of II stabilized at 0.5%.

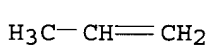
IC C07D301-20
INCL 260348160
CC 35-2 (Synthetic High Polymers)
Section cross-reference(s): 27
IT **Epoxidation catalysts**
(ethylbenzene hydroperoxide, for propylene, decomposition of)
IT **1308-38-9**, uses and miscellaneous 11104-61-3
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for decomposition of ethylbenzene hydroperoxide in propylene epoxidn. crude reaction products)
IT **3071-32-7**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(decomposition of, in crude propylene epoxidn. products, catalysts for)
IT **115-07-1**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, catalyst neutralization in)
IT **75-56-9P**, preparation
RL: **PREP (Preparation)**
(ethylbenzene hydroperoxide decomposition in crude mixts. from manufacture of, catalysts for)
IT **75-56-9P**, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(manufacture of, by epoxidn. of propylene, catalyst neutralization in)
IT **1308-38-9**, uses and miscellaneous
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for decomposition of ethylbenzene hydroperoxide in propylene

epoxidn. crude reaction products)
RN 1308-38-9 HCAPLUS
CN Chromium oxide (Cr2O3) (8CI, 9CI) (CA INDEX NAME)

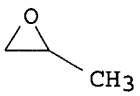
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **3071-32-7**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(decomposition of, in crude propylene epoxidn. products, catalysts for)
RN 3071-32-7 HCAPLUS
CN Hydroperoxide, 1-phenylethyl (9CI) (CA INDEX NAME)



IT **115-07-1**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(epoxidn. of, catalyst neutralization in)
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



IT **75-56-9P**, preparation
RL: **PREP (Preparation)**
(ethylbenzene hydroperoxide decomposition in crude mixts. from manufacture of,
catalysts for)
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)



RL: IMF (Industrial manufacture); **PREP (Preparation)**
(manuf. of, by epoxidn. of propylene, catalyst neutralization in

L49 ANSWER 26 OF 26 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1978:120966 HCAPLUS
DOCUMENT NUMBER: 88:120966
TITLE: Boride catalyst for epoxidizing olefinic compounds
INVENTOR(S): Gipson, Robert Malone
PATENT ASSIGNEE(S): Texaco Development Corp., USA
SOURCE: U.S., 6 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 4
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4046784	A	19770906	US 1976-699838	19760625
US 4038290	A	19770726	US 1975-565004	19750404
PRIORITY APPLN. INFO.:			US 1975-565004 A3	19750404

AB B compds. were used as catalysts for the liquid phase epoxidn. of olefins with organic hydroperoxides at 108-22° under pressure to give the corresponding epoxides. Thus, a mixture of 1-octene, Me3COOH, and WB was heated at 108-10° for 220 min to give 36% octene oxide. Among .apprx.30 other borides used as catalysts were LaB6, CeB6, TiB2, and ZrB2. Seven more olefins, e.g., propylene, allyl chloride, and cyclohexenecarbonitrile, were similarly epoxidized.

IC C07D301-20

INCL 260348290

CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 35

IT **Epoxidation catalysts**
(borides, for olefins with organic hydroperoxides)

IT **Epoxidation**
(of olefins with organic hydroperoxides)

IT 10043-11-5, uses and miscellaneous 12006-77-8 12006-78-9
12006-79-0 12006-84-7 12006-98-3 12007-00-0 12007-07-7
12007-09-9 **12007-16-8** 12007-27-1 12007-35-1 12007-36-2
12007-37-3 **12007-38-4** 12007-81-7 12007-98-6 12007-99-7
12008-02-5 12008-21-8 12008-29-6 12041-50-8 12041-54-2
12045-15-7 12045-19-1 12045-63-5 12045-64-6 12046-91-2
12069-32-8
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for epoxidn. of olefins with organic hydroperoxides)

IT **75-91-2 80-15-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of olefins with, catalysts for)

IT **115-07-1**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, with organic hydroperoxide, catalysts for)

IT **111-66-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, with organic hydroperoxides, catalysts for)

IT **74-85-1**, reactions 77-73-6 100-45-8 **107-05-1**
591-87-7 25168-07-4
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, with tert-butyl hydroperoxide, catalysts for)

IT 81-21-0P **106-87-6P** 141-40-2P **6387-89-9P**
26637-94-5P
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of)

IT **106-89-8P**, preparation
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of allyl chloride, catalysts for)

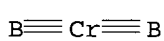
IT **75-21-8P**, preparation
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of ethylene, catalysts for)

IT **75-56-9P**, preparation
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of propylene with tert-butyl hydroperoxide, catalysts for)

IT **12006-79-0 12007-16-8 12007-38-4**
RL: **CAT (Catalyst use)**; USES (Uses)

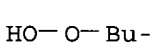
(catalysts, for epoxidn. of olefins with organic hydroperoxides)
RN 12006-79-0 HCAPLUS
CN Chromium boride (CrB) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

RN 12007-16-8 HCAPLUS
CN Chromium boride (CrB2) (8CI, 9CI) (CA INDEX NAME)

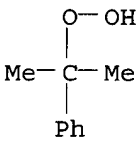


RN 12007-38-4 HCAPLUS
CN Chromium boride (Cr5B3) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

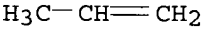
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **75-91-2 80-15-9**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(epoxidn. of olefins with, catalysts for)
RN 75-91-2 HCAPLUS
CN Hydroperoxide, 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 80-15-9 HCAPLUS
CN Hydroperoxide, 1-methyl-1-phenylethyl (9CI) (CA INDEX NAME)



IT **115-07-1**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(epoxidn. of, with organic hydroperoxide, catalysts for)
RN 115-07-1 HCAPLUS
CN 1-Propene (9CI) (CA INDEX NAME)



IT **111-66-0**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(epoxidn. of, with organic hydroperoxides, catalysts for)

RN 111-66-0 HCAPLUS
CN 1-Octene (8CI, 9CI) (CA INDEX NAME)

$H_2C{=}CH{-}(CH_2)_5{-}Me$

IT **74-85-1**, reactions **107-05-1 591-87-7**
25168-07-4
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(epoxidn. of, with tert-butyl hydroperoxide, catalysts for)
RN 74-85-1 HCAPLUS
CN Ethene (9CI) (CA INDEX NAME)

$H_2C{=}CH_2$

RN 107-05-1 HCAPLUS
CN 1-Propene, 3-chloro- (9CI) (CA INDEX NAME)

$H_2C{=}CH{-}CH_2{-}Cl$

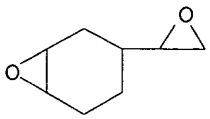
RN 591-87-7 HCAPLUS
CN Acetic acid, 2-propenyl ester (9CI) (CA INDEX NAME)

$AcO{-}CH_2{-}CH{=}CH_2$

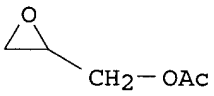
RN 25168-07-4 HCAPLUS
CN Cyclohexene, ethenyl- (9CI) (CA INDEX NAME)

$D1{-}CH{=}CH_2$

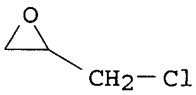
IT **106-87-6P 6387-89-9P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of)
RN 106-87-6 HCAPLUS
CN 7-Oxabicyclo[4.1.0]heptane, 3-oxiranyl- (9CI) (CA INDEX NAME)



RN 6387-89-9 HCAPLUS
CN Oxiranemethanol, acetate (9CI) (CA INDEX NAME)



IT **106-89-8P**, preparation
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of allyl chloride, catalysts for)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



IT **75-21-8P**, preparation
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of ethylene, catalysts for)
RN 75-21-8 HCAPLUS
CN Oxirane (9CI) (CA INDEX NAME)

IT **75-56-9P**, preparation
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(preparation of, by epoxidn. of propylene with tert-butyl hydroperoxide, catalysts for)
RN 75-56-9 HCAPLUS
CN Oxirane, methyl- (9CI) (CA INDEX NAME)